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[Special Editorial Correspondence.]

THIRTY-FOURTH ANNUAL MEETING, NEW ENGLAND ASSOCIATION OF GAS ENGINEERS.

YOUNG'S HOTEL, BOSTON, MASS., Feb. 18, 1904.

Dear JOURNAL: Having passed the "stage of ashes," although ice and snow were in plenty, the New England Association managed to recover sufficiently from its Ash Wednesday penance to meet in full array the second day of Lent. A large delegation was on hand to take part in the proceedings, and prominent in the representation were "some from the West," including the reigning President (Mr. F. H. Shelton) and two known quantities (ex-Presidents Somerville and Lynn) of the Western Gas Association. The present "reigner," all nerves and "go," made a queer physical comparison as between Dean Somerville and Sacristan Lynn, but as the labors of the Dean, the Sacristan and the King have been of much benefit to the gas cause in general and to the standing of the Western Association in particular, so it may be written may they never listen to a lesser welcome than that accorded them to-day. Of course, it was cold—Boston is seldom fervid—but the knowledge that spring and Easter were at hand kept up the circulation of everybody. President McKay called the opening session just before 11 to-day, and a goodly number were before him. The report of the Board of Directors was notable for the eventual fact that 19 names were added to the roll—7 active and 12 associate; and a particularly pleasing instance in this connection was the election to Honorary Membership of Mr. W. H. Bradley, Chief Engineer of the Consolidated Gas Company, of New York city. His step from Waterbury, Conn., to the metropolis was taken many years ago, but here is proof that those who knew him first remember him well. Some other routine business then occupied the meeting, after which came the President's address. It was well received, as it should have been, for he seldom goes beyond the pale of reason and conservatism in any speech he makes. Next came the reports of Secretary and Treasurer Gifford and an extended reference to the progress which had been made respecting the growth and solidification of the Association's Library. Roll call followed, after which the appointment of the Committees on Obituaries (5 in number) again brought to mind that the Association had suffered much through the dread reaper in the twelvemonth. And on the list was the name of Henry B. Leach, of Taunton, Mass., whose rugged, hearty presence, almost from the start of the Association, had at its meetings been second to none in the true advancement of its aims. He was sorely missed, and this especial reference to him in the mortuary roll is made, for he was of the Association's pioneers. Secretary Gifford here mentioned the usual correspondence received from those who were unable to attend the meeting, and in connection therewith was a telegram of congratulation from the Wisconsin Gas Association—the young to the old—then in annual session at Milwaukee, to which suitable reply was ordered sent. During a lull a question from the box was considered. That disposed of, the Western Gas Association, through President Shelton, presented to its New England confreres a set of the Western's excellent "Card Index to Gas Literature," and an invitation to the New Englanders to be present at the exhibit proposed for the St. Louis Exposition on general gas account for the country. Other invitations of a kindred nature (from the Western Gas Association and from the American Gas Light Association—through its Chairman on such matter, Mr. C. J. R. Humphreys—and and from the Society of Civil Engineers), to share in the proposed International Gas Congress at St. Louis, were accepted. It was then agreed upon that the New England Association appoint a committee to share with the other Associations in perfecting the work underway. The first paper read was that by Mr. T. H. Hintze, of Lowell, Mass., whose lines on "The Installation and Maintenance of Gas Arcs" led to a spirited debate, in which "gas arcs" seemed to be well favored. The election for officers resulted in the naming of: *President*, F. S. Richardson, North Adams, Mass.; *First Vice-President*, Wm. McGregor, Pawtucket, R. I.; *Second Vice-President*, W. G. Africa, Manchester, N. H.; *Secretary and Treasurer*, N. W. Gifford, East Boston, Mass. The Association wisely decided that the salary of the Secretary should be increased to $300, after which an adjournment of the session was ordered. Everybody to whom I have spoken reports good business, and the impression is that gas works plant constructors will have many chances to bid on extensions and betterments this spring.—S.

YOUNG'S HOTEL, BOSTON, MASS., 11 P.M.

Dear JOURNAL: The afternoon programme (the session was called to order at 3 P.M.) was commenced by the reading of the paper on "Inclines," by Mr. C. H. Gifford, of New Bedford, Mass. His presentation of that which has been accomplished at New Bedford with inclines rather goes to show that no mistake was made in their installation. Naturally, next in order was the paper, by Mr. C. F. Prichard, of Lynn, Mass., on "Inclines," as these appear in working order in Mr. Prichard's city. As it is with Gifford, so it seems to be with Prichard; his presentation of the subject being in accordance with the accurate style of the man from Lynn. The joint discussion that followed was of great interest. In fact, it held the close attention of everyone present. (An other dip into the Question Box brought the day's technical proceedings

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to a close. The Directors elected—I failed to name them earlier—were: W. G. Africa, W. H. Snow, J. E. Nute, B. J. Allen, T. H. Hintze and D. D. Barnum. The weather is clear, but "Bostonly" cold. The attendance, however, is excellent and the meeting has been in every sense up to the New England's standard.

In the banquet which was directed by Mr. McKay in his usual calm and concerted, but not prosy, style, 100 or more shared. The silver haired, golden hearted captain (I do not have to name him further) had a word or two to say, as did others, that goes to show that gas is still being used—and paid for. The "spread" was all that even a New England man could ask for. If possible, I will forward Friday the story of the finish of the meeting: but I fear it may not come to hand in time, knowing as I do that presses will not wait, unless something happens to the machinery. Put down anyway that the Mother Association shows no sign of growing old.—S.

[Special Editorial Correspondence.]

ELEVENTH ANNUAL MEETING, MICHIGAN GAS ASSOCIATION.

SAGINAW CLUB, SAGINAW, MICH., Feb. 17, 1904.

Dear JOURNAL: Much of the attention of the world is at present directed to the struggle going on between the "Slav" and the "Jap.," where endurance and hardihood have good chances for illustration; but the desire of your correspondent just now is to call the attention of the gas fraternity to the bravery and daring of the valiant band of heroes that make up the rank and file of the Michigan Gas Association, and who have braved the elements of Michigan's severest weather to participate in its eleventh annual convention, which at the time of writing has just closed its first day's programme of business and pleasure. A fairly good attendance greeted President Cobb when the meeting was called to order, at 10 A.M. this morning, in the assembly rooms of the East Saginaw Club, which by-the-way, is one of the best appointed clubs in the State, and the assembled members soon forgot the physical discomforts incidental to their arrival in the pleasure of listening to the President's address, which touched on many live issues of interest to the "Gas man," and was well received by his hearers. Mr. John Hellen, of Grand Rapids, Mich., then read a clever and comprehensive paper on "The Laying of Mains and Services and the Recording of Same." It is a mine of information on the topics specified, and its practical worth will be better appreciated later on when its details will be referred to by "men who want to know." Owing to the severe climatic conditions at this season of the year, and the inconvenience to many members on account of business relations of such, it was proposed that the date of the meeting be changed to the third Wednesday in September. After discussion the matter was placed in the hands of a Committee, with instructions to report on same at the morning session to-morrow. After spirited discussion of several of the inquiries in "Question Box," the meeting adjourned, to reconvene at 2:30 P.M. The afternoon session was well taken up by the reading and discussion of the following papers: "A Few Notes on Ammonia," by Mr. F. E. Sheriff, Battle Creek, Mich.; "The Laying of High and Low Pressure River Gas Lines," by Mr. H. C. Morris, Bay City, Mich.; and the "Care of Benches and Results Therefrom," by Mr. T. J. Whalen, of Jackson, Mich. The balance of the afternoon's proceedings were unmarked by any events of especial moment. An adjournment was ordered at 5 P.M. At 7 P.M. the members assembled in the large dining room of the East Saginaw Club to participate in a beefsteak supper, which proved in every sense a most enjoyable function. Mr. Fred. Parsons acted as Toastmaster, in his usual inimitable style and Mr. "Al." Eaton kept the ball rolling with a number of his ever-welcome stories. The appreciation of the hospitality and general good fellowship of President Cobb and the men of the East Saginaw Club was amply voiced by the remarks of several of the guests, bringing to a close a most successful and satisfactory day.—P.

SAGINAW, MICH., Feb. 18, 1904.

Dear JOURNAL: The weather man did his level best for us to-day, by raising the temperature 15° or 20°, and the Association came to order with a good attendance of warmly clad men. Mr. A. P. Ewing, of Detroit, read a paper on "Advertising as Advantageous to the Gas Business." It was of the order interesting, and its reading was followed by a lengthy discussion, in which differences of opinion were freely put out, particularly in respect of his classification of funds invested for advertising purposes. The consensus of opinion was that advertising expenses should not be charged to capital account, as advanced by him. Mr. Samuel Ball, of the University of Michigan, presented a very technical and scholarly address on "The Progress of the Study of Naphthaline," which contained the conclusions drawn from investigations of the subject made at the University which, owing to lack of time, was incomplete. His remarks were listened to with great interest, and the final will be very acceptable when it is concluded at the next meeting. The Committee appointed on changing date of meeting to the third Wednesday of September reported in favor of the change, and the report was unanimously approved. The next meeting will be held in Jackson, Mich., beginning the third Wednesday in September, 1904. Mr. S. E. Wolff, of Jackson, Mich., was elected President. Mr. Ernest Lloyd was chosen Vice-President, and Mr. H. N. Douglas was re-elected Secretary and Treasurer. After appropriate and well earned votes of thanks had been passed to the officers, the "Club" and the committees, the convention was declared adjourned. —P.

BRIEFLY TOLD.

HOUSING ARRANGEMENTS FOR THE WESTERN GAS ASSOCIATION MEETING AT THE WORLD'S FAIR.—Mr. E. G. Cowdery, Chairman of the Committee of Arrangements for the St. Louis World's Exposition meeting of the Western Gas Association, informs us that the Committee has selected the Hotel Jefferson as headquarters, and that the sessions will be held from June 15th to 18th. The Jefferson's proprietors have agreed to reserve 75 rooms, at rates ranging from $7 to $12 per day, European plan, which prices entitle double occupancy of each room. Baths go with each room. The reserving must be made prior to March 15th, and the "party *signing* the contract" must pay for the room for the duration of the time for which it was engaged or hired, whether occupied or not. The Committee will later on conclude the terms for berthing at the Planters and the Lindell Hotel. St. Louis people seem to be quite thrifty—that is, those of them who are engaged in the hotel trade—for the Committee has done and will do all that can be done for the ones whom it is trying to serve.

[OFFICIAL NOTICE.]

Twentieth Annual Meeting, Ohio Gas Light Association.

OHIO GAS LIGHT ASSOCIATION,
OFFICE OF THE SECRETARY, DELAWARE, O.,
February 15, 1904.

The Twentieth Annual Meeting of the Ohio Gas Light Association will be held at Cleveland, O., March 16th, 17th and 18th.

The President, Mr. John D. McIlhenny, of Philadelphia, Pa., will call the meeting to order on Wednesday, March 16th at 9:30 A.M., in Assembly Hall at the Hollenden Hotel, the headquarters.

The following will be presented at the meeting:

"Question-Box," edited by Mr. Henry L. Doherty, New York City.

"Progress Department," edited by Mr. Irvin Butterworth, Detroit, Mich.

"Novelty Advertising Department," edited by Mr. B. W. Perkins, South Bend, Ind.

"Wrinkle Department," edited by Mr. E. E. Eysenbach, St. Paul, Minn.

Reports of Committees:

"Uniformity of Gas Meters," Messrs. Chas. S. Ritter, Detroit, Mich.; R. Shacklette, Adrian, Mich.; Donald McDonald, Albany, N. Y.

"Standard Sizes for Coke," Mr. C. W. Andrews, Duluth, Minn.

"Uniform System of Mapping Mains," Mr. W. H. Barthold, Grand Rapids, Mich.

"Standard Methods of Testing Fuel Gas Appliances," Messrs. Henry L. Doherty, New York City; F. W. Stone, Ashtabula, O.; John Franklin, Cincinnati, O.

"Flow of Gas in Pipes," Messrs. H. A. Carpenter, Pittsburg, Pa.; J. D. Shattuck, Darby, Pa.; J. O. Johnston, Columbus, O.

"Bureau of Forms and Records," Mr. F. W. Stone, Ashtabula, O.

Papers:

"The Construction and Operation of Recuperative Benches; No. 2," by Mr. W. A. Baehr, St. Louis, Mo.

"Why English Gas Outputs are Large, with Lessons to be Drawn in the United States," by Mr. J. T. Westcott, London, Eng.

"Economy in Oxide Purification," by Mr. H. L. Rice, Norfolk, Va.

"High Pressure Gas Street Lamps," by Mr. J. J. Knight, Kalamazoo, Mich.

"Care of Station Meters," by Mr. Henry R. Cartwright, Philadelphia, Pa.

Short Topics:

"District Collection of Gas Bills," by Mr. F. W. Frueauff, Denver, Col.

"Burning Coke Breeze on Hollow Grates," by Mr. C. H. Williams, Madison, Wis.

"Burning Coke Breeze with Under-Feed Stokers," by Mr. M. E. Malone, Denver, Col.

"Water Gas Tar Used in Generators for Enrichment," by Mr. Henry I. Lea, Fort Wayne, Ind.

"Industrial Fuel Gas Appliances," by Mr. J. Chas. Andrews, Denver, Col.

Competitive Papers:

"Best Arrangement for Recovering and Utilizing the Waste Heat from Gas Benches." Premium offered by the President, Mr. John D. McIlhenny.

An opportunity will be given any of the speakers at the meeting to correct their remarks before leaving Cleveland, but not after, as all the reports will be turned over to the printer immediately after the meeting.

The Hollenden is conducted on the European plan, and the following rates have been secured for the meeting: $1.50, $2, $2.50, $3, $3.50, $4 per day for each person, each room to be occupied by two people or paid for accordingly.

The Hollenden hopes to entertain all of the Association and will put forth every effort to make the members comfortable. The most satisfactory quarters are always obtained by writing in advance to the hotel people.

Special railroad rates are being secured for the meeting and will be announced later.

The Secretary will furnish with pleasure application blanks for membership and any further information which may be desired relative to the meeting.

T. C. JONES, Secretary.

Address of the President of the Michigan Gas Association (Mr. B. C. Cobb, of Saginaw, Mich.), on the Occasion of Its Eleventh Annual Meeting, Saginaw, February 17 and 18, 1904.

Gentlemen: A year since you saw fit to give me pleasure by conferring upon me the honor of acting as your President, and by consenting to hold your Eleventh Annual Meeting in Saginaw, my home city. This double honor I assure you has been appreciated, and as best I could I have endeavored to merit this confidence by entering into the work with full heart and vigor and with one idea in view—the success of our Association.

And now, before I forget my manners, let me say, on my own behalf and that of my fellow townsmen, you are more than welcome to Saginaw and its joys and pleasures. It's a good town and a liberal town, and its people are of the warm and proper sort, who know a good fellow when they see him, even though he be a gas man evil. Therefore, my merry men, my sober men, and men that are "betwixt and between," enjoy yourselves in such manner and in such way as may suit your fancy best, remembering always that you are welcome guests within our gates.

Now that my opening remarks are concluded, I advance in fear and trembling to touch upon some of the things which I assume should be part of a President's address. In doing so, however, I hope you will bear with me and make allowances with the knowledge that, although "The spirit is willing the flesh is weak." In fact did I not know that you are of lenient and kindly disposition, my courage forsooth would long since have left me. It seems assured that this, our annual meeting, will be more successful than ever, that our membership will be largely increased, and that the character of our papers will be high grade and commendable. To me this is encouraging and satisfying, and I hope that each of our Presidents hereafter may have the same satisfactory feeling.

Membership.—It seems to me that an organization of this kind constantly needs new members in order that it may be successful and prosperous. This not that the old members grow tired of each other and the work of the Association, but because in this great American country of ours a thing must be constantly growing to be successful, and because we need new life to keep us stirring.

This new life, together with the old, is what we need, and we should never miss an opportunity of adding another name to the roll of active or associate members. Upon this subject I am heartily in accord with the ideas of our honored President of the year previous, "That each gas company in the State should be represented in this Association by not only each officer and superintendent, but by the Directors of the company as well." Also, that gas appliance and supply houses interested in the advancement of the gas business, should have one or more members in our Association. This getting new members is just like any other business; if we want them to come our way, we must go out after them. Sitting still and waiting will never get them.

Scholarship Fund.—The scholarship fund in the Michigan University was liberally subscribed to at our last year's meeting, and I have no doubt that this year's subscriptions will equal and surpass those of last. This certainly is something of which we may well be proud, for I think ours is the only Association supporting and carrying on such a work.

In this connection I have occasionally heard the question asked, "Is it well for us to continue this work? Are we as gas men deriving any benefit from it?" In answer I would say assuredly, yes; and I think you will agree with me that we can ill afford to give it up. We, of course, are educating technical gas men each year, who, after leaving college, cannot be counted upon to forever reside in Michigan and be connected with a Michigan gas company; for should the way be open outside our famous State for advancement, it is no more than right, no more than natural, that this way should oft be travelled. I for one, and I think all of you in a case of this kind would be glad to say, and with considerable pride, "Our Association, through its scholarship, assisted this young man and is interested in his career."

Gas Appliances.—There has been, so far as I can learn, no remarkable advance or improvement in this particular branch of our profession during the past year. The gas arc lamp, a friend indeed since its advent, has displaced many an electric arc and bulb, with the satisfying sense of giving better service and increasing our sales.

You see I am still true to my old love, and that the wiles and snares of the electric siren have not as yet entirely beguiled me. We must, however, look to our laurels and be not content, for while the gas arc lamp has done wonders and revolutionized store and office lighting, it is not for houses, and can never take its place as a parlor or dining room ornament or necessity. The single, small light of the same character is what we want, must have, and will get. Bright and brainy men are steadily working to obtain this result with gratifying assurances of success. With this achievement the gas man's "Bogie" breakage of glassware with Welsbach mantles will forever and all time be routed and destroyed.

State Gas Commission.—It is to be regretted that, through force of circumstances, the committee appointed at last year's meeting to report on this important subject has been unable to act. This is a matter that should be given most careful thought and consideration, for while we are now perhaps so to speak more or less surrounded with dangers and pitfalls, still let us not jump out of the pan into the fire.

The Massachusetts law has its good and its bad points, and if we still continue to think it advisable to inquire into the advantages of a similar law for Michigan, I would recommend that a committee of three be appointed to thoroughly investigate the workings of the Massachusetts law, with instructions to report at our next meeting; and, further, that this committee be allowed necessary expenses for making a trip to Massachusetts, and enough money to permit consultation with competent attorneys, if it so chooses.

Advisory Committee.—Another important matter suggested at last year's meeting remains to be disposed of—the establishment of several advisory committees or consulting boards, for the purpose of giving technical or practical advice to any gas company or gas man in the State, upon application. The original idea was, I believe, to have the members of these boards paid stated yearly salaries, the expense to be assessed against each company on a basis of ¼ cent per 1,000 cubic feet of gas sold.

While I do not wish to disagree with a former President, a man of broad and liberal mind, I personally am of the opinion that, if such a plan should be adopted, some of the companies would be bearing an expense much larger than the benefits derived would justify. However, this is a subject that will bear considerable discussion, and I hope to hear it.

Labor.—During a year of almost unceasing strikes and labor troubles, the gas companies have pulled along without much direct trouble or annoyance. Indirectly, however, the effects of other strikes and difficulties have been felt, but in such a way as not to cause undue alarm. The labor problem appears to be a long way from settlement, and the study of its eccentricities far from complete. "A fair day's pay for a fair day's work" sounds well, and is no more than right, but by whom and how shall the fair pay and the fair day be decided? It is to be regretted that in the heat of passion unfair and harsh things have been said by both sides; that methods have been adopted by employer and employee that have not reflected creditably upon either; human nature finds it hard to practice the golden rule. This is a subject that men of vast experience, of mature and ripened minds, are giving deep and careful thought, and I am ill-equipped to enter into its discussion. I feel, however, that we should study well what we do in this direction and not enter upon a way appearing fair and easy, only to find it later on full of thorns and brambles. We must admit that labor has to some extent benefitted by its unions; also injured. The peculiar nature of our business does not allow the so-called "closed or union shop," and we, I think, should guard against it. Let us be fair, however, and not invite criticism by arbitrary and forceful methods. Unjust discrimination is not popular, neither is it wise.

Coke.—The present condition of the coke market is not such as to give us cause for congratulation. How to sell our production and the determining of standard screens and sizes are problems worrying many of us. The increase in sales of coke has not kept pace with the wonderful increase in sales of gas during the past few years, and we must bend our energies toward popularizing this genuine gas house product. The field is large, and our prospect of success good, for we have an article, if properly used, that is cleaner, cheaper and better than any other hard fuel.

Gas Advertising.—No other department of our business in recent years has shown more improvement and advancement than the advertising department. It is an interesting study and one that, properly handled, will pay any company well. If we wish to sell our wares we must bring them to our friends, the public. The old policy of "Come and get it if you want it" long since died a lingering death: and I think will sleep tranquilly for evermore.

Length of Meetings.—At last year's meeting the advisability of lengthening our yearly sessions to three days instead of two was discussed pro and con. I think we should again give this matter consideration, for it is most important. Two days, in my opinion, hardly give the necessary

time needed to properly conduct our meetings. In this connection I would recommend that the initiation fee and annual dues be raised from $2 to at least $3, and perhaps $5. Certainly the additional expense is not large and the Association can well use the money.

Gentlemen. I thank you for your attention and again bid you welcome, with the hope that your stay in Saginaw may be pleasant, profitable and enjoyable.

Care of Benches and Results Therefrom.

[A paper read by Mr. T. J. Whalen, of Jackson, Mich., at the Eleventh Annual Meeting of the Michigan Gas Association.]

Gentlemen: For my subject I have "Care of Benches and Results Therefrom." Considering the many points of interest, I find it requires considerable space to bring before you the care I believe benches must have to produce satisfactory results. In this paper I shall endeavor to illustrate to you the causes of poor results and a few of the existing troubles in retort houses. We all well know, no matter what the occupation, we must have a foundation, and a good one, in order to make a success; otherwise trouble will exist.

Now, I want to impress upon all that the foundation of the success of a bench is the care it gets, and I shall endeavor to show you just what care for a bench has done and can do. Judging from years' of experience, I say no man can get good results if carelessness is allowed to exist. In cases where good results are obtained with carelessness existing I want to say that those good results are the outcome of insufficient or inaccurate accounting, which will sooner or later appear.

Care for a bench will construct it properly; it will protect its material; it will see to it that only good material is used for the bench, and this well put together and well cared for. When you find material lying around the yard; settings thrown in a heap like cobblestones; retorts chipped, cracked or broken, or the settings thrown from car to cart or wheelbarrow, as the case may be; or if, when putting the bench together, you find the setting blocks not fitting and the masons using plenty of mud and pieces of brick to make them fit; that the retorts are too high, or too low, and the standpipes too long or too short, and various other troubles, you will realize that all this could be avoided if you remember "Care for the benches."

I want to impress upon you that care for the benches won't have the material exposed to rain or snow; won't have the bricks and settings chipped, cracked or broken, and will not have the standpipes too long, allowing no room for expansion, with the consequent cry about mouthpieces coming off and standpipes without room for proper joints. If care is not taken in this matter, you will have your stokers daubing on clay to stop the worst of the leaks day after day. Care for the benches will allow no settings backed up with mud and pieces of brick; it will allow no poor material of any kind; it will send the carload of such material back into the railroad yard, subject to shippers orders. "Poor benches" is no excuse for any superintendent to submit while good ones don't cost any more.

Some people get the idea into their heads, when they see stokers drawing, charging, firing and clinkering, that that is all there is to it. This is a very mistaken and expensive idea. When we find a bench giving satisfactory results, and continuing to do so, day after day, month after month and year after year, I want to say to you it has required a great deal more care than the stokers can give it. If we leave the care of the benches entirely to the stokers we will soon realize our mistake. I know I do.

We have in this State a large number of stokers, and I have come in contact with a great many of them, and very few were competent enough to run benches successfully. When I illustrate this to you it is possible you will agree with me in this statement.

What is the cause of mains pitching; the tar thick, dirty and poor, or, in other words, no good to the contractor; the standpipes plugged up; retorts full of carbon; fireboxes full of clinkers and the sides of same burned out; charging door frames falling off; sighting box slipping down; retorts sagging; primary flues stopped up; secondary flues stopped up; recuperators so badly coated with soot that the secondary air is not heated; heats way down; the bench fuel climbing; heats way up; average charge and yield way down; expense increasing all the time; 6 benches doing what 5 ought to do; old stokers going and new ones coming in; rakes burned, bent and broken, and new benches needed, though the old ones are not much over a year old. What's the cause of all this? It is benches not cared for; lack of system, or the same not properly enforced; or, perhaps, they were left in stokers' care, which is not quite sufficient to successfully operate them.

I will call your attention to a few cases where I have come in contact with men from whose conversation you can readily see that care for the benches could not be expected. One said to me he was having all sorts of trouble. First of all, his benches were only a few months old, and the mains and pipes were pitched and plugged all the time, especially the bridge pipes. "Sometimes I believe the benches are too hot. Anyway, the coal is no good. Oh, it is a fright; the expense under which we are operating."

I met another fellow when his benches were about 10 months old. He said, "I am having an awful time. The mains and pipes are plugged all the time, and the retorts have big holes in them already, and the setting box is falling down on top of firebox arch stopping up the flue holes. Sometimes it doesn't heat like it used to and it is getting worse daily. If it continues, I shall have to shut it down and see what is the matter with the old thing. Anyway, I am satisfied the bench was a mighty poor one."

Another fellow whom I met when his benches were about 18 months old, asked me, "How do your benches act when they are getting old?" I told him if great care is not taken of them they go up and down quickly and use up more fuel on account of so much patching, cracking, sagging and stopping of flues, especially secondary flues where they enter the furnace. He said, "That is just what is the matter with mine. They have all those troubles together. The old retorts are full of carbon and I hate to try to get it out, for I believe the old things will fall to pieces. The firebox is full of clinkers, eating up all the fuel I can get into it." I asked him if he had any trouble with mains or pipes. He replied, "Heavens! no, man; the retorts are so cold I can hardly see the heat sometimes. I would like to run it until I get the other one ready. If it doesn't hold up I will have to start the water gas machine. One thing I do know, when I get this old bench out I will never put the same kind in again."

When such statements as these come before us, we must consider lack of experience, lack of bench knowledge, and carelessness all combined. Operating a bench like the above, under such conditions, is an expensive mistake. I want to say to you, care for benches during their construction, the use of good retorts and settings, well protected and all that sort of thing, is only time lost in these cases. The good ones melt down as fast as the bad ones; therefore, procuring good benches to be used like that is only money and time spent for nothing.

These facts illustrate plainly that the benches are running the men, instead of the men running the benches. Think of a man expecting good results and allowing his benches to burn up, and then saying they are no good. I will suppose a case: If I went to run a steamboat I am satisfied while out on the sea I could plow along nicely, the boat would go along all right, and I would think I was a captain; but the very first obstruction that appeared I would probably run into it, and unless somebody came to aid me I would end up with a wreck. Then, to save my reputation as a captain, I could tell the owner the boat was no good. However, I believe I should have my grip packed before the owner came aboard.

I don't mean to say care for benches would make them last forever, but it will operate them successfully up to their capacity for 3 or 4 years.

I shall now illustrate to you what care I give benches. I shall take into consideration the entire retort house system at Jackson. We have 2 stacks of benches, 5 in one and 3 in the other. They are ¾ depth, recuperative furnace design, fitted with double smokestack dampers. We are running 5 of these benches, which have been under fire from 14 to 34 months. When I take the carbon out of the old retorts, it is very seldom that more than 15 minutes is required to patch one. In some of these retorts no patching, or scarcely any, is required. The 14 and 15 months' retorts are practically new. I find it no trouble to do this at all. It is simply care for the benches.

One of the most important features of a bench during its operation is the fire box. Our fire boxes are treated as follows: When using coal or coke as fuel, the furnaces are filled within 10 inches of arch tile of fire box, and great care is taken to have the back end of fire box as full as the front. When firing the furnace care is also taken to fill it from back to front with the shovel; that is, to throw the fuel to all parts of the furnace, not to drop it in and then shove it back. When the fuel is dropped in through the door whatever fine stuff there is packs up in front, and one part of your fire is loose and the other is solid. Your fire box filled up that way acts like a purifying box, of which one side is filled with new material and the other with old material. Furnace doors that are so small and so arranged that fuel cannot be thrown back are not economical. They are very injurious to the furnace, because the back end will be continually hotter than the front, and the same with

the retorts. Charge the furnace as carefully as a retort. When a furnace receives a little heap of fuel in the front or middle of the fire box, the company suffers as much loss as when a little heap of coal is thrown into the front or middle of a retort. First of all, your fire box gets so hot in the back it soon grows together with clinkers. While it is getting very hot up goes your heat, especially in the end of the retort, and the carbon on those days is accumulating, inch by inch, in the back end. When your clinkers are formed your nice, hot, loose fire is shut off, down go your heats, and then you begin to dig. I have found a remedy to stop it. The fire box doors through which the benches cannot be properly fired are the doors I would not have, for the following reasons: They cause high fuel results, decrease the bench capacity and increase the wear and tear. If you saw a man charging a retort by dropping coal down a standpipe you would not see anything more expensive than when you see a man dropping it into the fire box through a little pigeon-hole door. I want a man that is as careful in charging the furnace as in charging the retorts.

In running 5 benches our system is as follows: We make what is called a round every hour, consisting of drawing, charging and firing or breaking up. When this round is finished we are through with the fire boxes. Each retort is charged every 4 hours and each furnace is charged every 2 hours. The hour between the charging of furnaces they are broken up from the charging floor when using coal and from the ground floor when using coke.

The bottom of the furnace is cleaned out every 6 hours, exercising great care to remove no fuel from the fire box. The ashpan is cleaned and all cinders that might get into the primary air ports are taken out, the ashpans filled with water and the steam under fuel regulated. The amount of steam used is regulated by the stoker, who is governed by the condition of the fire. The steam-pipe is so arranged that the steam goes into the fuel directly at the center crossbar holding up the grates. It is a ¾-inch pipe, fitted on the end with a cap having a hole ¼ inch in diameter drilled in it. The pipe extends in and up at an angle of about 45° to about 8 inches past the crossbar. This steam helps a great deal toward preventing the formation of clinkers, the fuel burning more to ash. When the stokers are hooking out the furnace they find very few clinkers and lots of ash. Just before the fuel in the fire box comes to a white heat steam is admitted. When it does not appear white no steam is used. When this system is properly used, with the assistance of the breaking-up bar, very few clinkers appear.

The breaking up is done with a bar 1¼ inches by 8 feet, with a hand ring at the end and a chisel edge. This bar is pushed down to the front end as closely as possible, in order to prevent the big clinkers on fhe front of fire box over the water table, commonly called "hoods." Then the bar is pulled backward, throwing back the fuel and breaking up the front of the fire; consequently the fire becomes loose all through and uniform heats are obtained. When a fire is properly treated in this manner, primary air ports will be very little used, stack dampers nearly shut off, and secondary air ports nearly wide open, resulting in economical firing and producing proper combustion. Then the wear and tear of the bench comes quietly, not in jumps, as in the case of the fellow who said his bench was no good and his coal was no good.

When using coke as fuel I treat the fire box a little differently. Instead of breaking the fires up from the top every two or three hours, they are broken from the bottom every two hours and from the top every six hours, or, in other words, every time we clean out. When using coal in furnaces supplementary bars are used once per week. When using coke it is found necessary to use these bars at least twice a week.

These supplementary bars are put in on top of the water table, or about 24 inches above the grate bars. All clinkers, from back, front and sides are removed, care being taken not to remove the fuel. When this is done, an ordinary retort rake is put through the firing door and all the fuel on the bridge wall drawn back into the fire box. This leaves the furnace level full, as if it had only been hooked, and then a small amount of fresh fuel will put the fire box in its original condition, and we have suffered no loss of heat through clinkering. We don't have the old familiar excuse, when the question is asked, what is the matter with that bench? "Oh, it was clinkering this morning; it has gone down," for care for the fire box has kept it up. When you see fire boxes being emptied out and ask what is the matter, and they answer that they weren't clinkered and are full, your results have got to suffer, and the bench will be injured by the sudden change in temperature.

Show me a man who empties out his fire box, still showing up good fuel results, and I will guarantee he *estimates* his fuel. I have stokers in Jackson, since October, 1901, and they have never seen what a fire box looks like on the inside, for we never yet had one empty. Care for the fire box prevents the trouble experienced with clinkers.

Another very important matter I wish to call to your attention is that of openings in the fronts of the benches. A very few openings will increase the fuel 5 to 10 per cent. I keep all openings and cracks in the fronts of benches well plastered up. It helps a great deal toward heating the front end of retorts and decreases the fuel per ton carbonized. Another very important feature is keeping the secondary air nozzles open, where they enter the furnace. Keep the primary chambers and ports clean, and especially keep the recuperators clear; otherwise, the secondary air will be admitted cold.

To determine how to operate a bench economically, in changing from coal to coke, requires constant watching. I experienced considerable trouble with the heats. First, I used half coal mixed with coke. Next, one-quarter coal and then one-eighth coal, until I had them firing with straight coke. Then I decided that uniform heat could be kept and as much coal carbonized with coke as with coal. In the following month I changed another retort house from coke to coal in the same manner and experienced no trouble either with the heats or the men. I also determined greater care of the furnace must be taken when using coke, or the lining will be injured, provided you are running a bench to its capacity. Of course, we all realize the fact that a man can run a bench 10 or 15 years, but I want a bench to run to her capacity, not having three benches doing what two ought to do.

There is another feature of our business which is a secret to some of us, and that is the charging of retorts. When retorts are charged right it means a great deal. We have spent considerable time toward obtaining uniform heats and must do a great deal to obtain uniform charges. Uniform charges will help greatly in keeping the heats uniform. They will raise the charge, increasing the capacity of the bench and helping to prevent hydraulic main trouble. They will prevent stopped standpipes, and do away with furnace trouble. They will also improve furnace fuel results; but, remember, it is only uniform heats that gain the greatest good from uniform charges. I don't mean to say that uniform heats and uniform charges will do away with all of our troubles; but I do say that, with care for the benches, they can run them up to their capacity day after day, without delay on account of mains or pipes. I had a bench cross circuited once in Jackson, and it took me 10 days to get it back to its capacity. Such cases as these I realize must be considered. When a retort is properly charged the coal is level, the same height back to front, tapering down at the mouthpiece. I have two men charge together. I train them to charge crosswise, so as to get the coal up against the sides of retort; in other words, to keep the coal in retorts as low as possible. This system prevents superheated gas, which gives rise to thick tar, lampblack, stopped pipes and naphthaline troubles. All of our charges are inspected by the foreman, and a record left on the superintendent's desk, reporting how he received everything from his opposite foreman, and such conditions are carefully noted. The charging is left to the foreman's judgement. If one retort or bench appears a little hotter than the others, which is very seldom the case, he orders a little more coal put into it, but always carbonizes in the two benches the amount of coal decided upon by the superintendent.

Under our system of stoking, the duties of the men are so arranged that all have equal shares of work, and each man becoming experienced in his particular part, they have no trouble in obtaining good results. We have five stokers in each gang, running five benches. No. 1 stoker, or so-called house foreman, is responsible for all the work. His duties in particular consist of taking care of exhauster, and looking after the main to see that it is in good order, that the seal is not too high or too low, thereby obtaining uniform pressure in standpipes. The day foreman runs off the tar tank and takes care of the tools, seeing that they are in good shape for the night foreman. He is also responsible for the neatness in the appearance of the house.

In the retort house in front of the benches, I have a double acting water gauge by which the foreman is governed in adjusting the seal on the main. The diagram affords an illustration of this gauge.

No. 1 is a line running from the standpipes to gauge and of use in determining the pressure on standpipes.

No. 2 runs from hydraulic main to gauge and gives us the amount of vacuum in main.

No. 3 is a connecting line for gauge.

It is not practicable to connect the lines direct to the top of gauge, as the tar matter would soon render the gauge glasses useless; therefore, the separate lines run into the header at the bottom, and this header is provided with drain cocks 4 and 5 to draw off tar or other condensation.

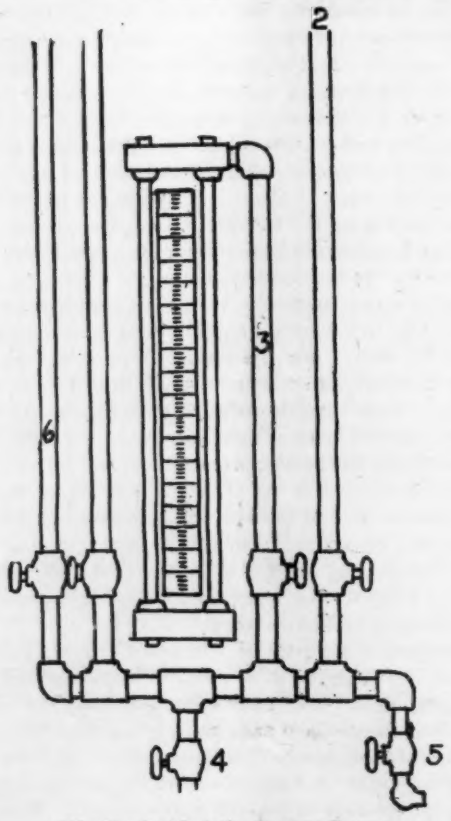


Fig. 1.—Double-Acting Pressure Gauge.

No 6 is steam connection for clearing out the lines. Each line has a separate valve.

The duties of the other four stokers are as follows: No. 2 helps No. 1 to do all charging and firing, looks after stopped pipes and helps in breaking up and clinkering fires. No. 3 stoker helps in the drawing of the retorts, keeps the house clean, looks after all leaks on benches and assists in firing, breaking and clinkering. No. 4 stoker draws 1 or 2 retorts on each round and loads all coal. No. 5 stoker draws 1 retort on each round, takes care of all the coke and ashes and is responsible for the appearance of the cellar. This division of duties is adhered to as strictly as possible, although any man is perfectly welcome to assist any other as long as his own work is properly done.

The men work in 2 shifts of 12 hours each, beginning at 6 A.M. Each round begins with the hour. We open 6 retorts at 1 hour and 9 the next, alternating thus through the day. We open one side of every other bench, pulling the top, middle and bottom retorts at the same time. Great care is taken when the lids are being opened to prevent what is called "shooting" them off. They use for lifting these lids a piece of old iron which is kept in the opening of the cleaning plug, between the middle retorts. This opening is fitted with a piece of ¾-inch pipe, well bedded in fireclay and salt, and is also used as a sighthole to determine the condition of the bench. This can be done at a glance after you become familiar with it, and the stock dampers can be set by these observations. Care should always be taken to prevent the "shooting" of lids, because it is very injurious to the bench. It helps to loosen the setting blocks and recuperator tiles and joints, which in time will cross circuit the bench. This "shooting" of lids will also keep you well supplied with leaking mouthpieces.

When the lids are opened No. 2 stoker chips out the mouth of each standpipe, which prevents the accumulation of soot and tar and makes it much easier to get the reamer through the pipe.

Only 6 retorts are opened at one time. When we have 9 to charge the last 3 are not opened until the first 3 are closed. While No. 2 stoker is chipping out the pipes, Nos. 1 and 5 ream out the first 3, and Nos. 3 and 4 ream out the other 3. In reaming we use an auger reamer, 5 inches in diameter, with a long handle. This reamer is pushed to the top of each pipe. Stokers Nos. 1, 2 and 5 draw the first 3 retorts, all working together. When these are drawn, Nos. 1 and 2 begin charging, while No. 5 quenches and takes out the coke. Nos. 3 and 4 draw the second three retorts, and when there are nine to draw they open the third three as soon as stokers Nos. 1 and 2 have the first three charged. Nos. 3 and 4 also take care of the coke that scatters on the floor, pushing it down the chutes and closing same, so that no charging coal will find its way to the coke bin.

We usually have the first three charged in about 6 minutes. The first 6 are charged and closed in from 8 to 11 minutes, and when they have 9 to charge the other men usually have the last three drawn and ready as soon as the second three are charged; thus the entire 9 retorts are charged and closed in from 14 to 17 minutes. We find, if we do not continue to keep after the men to get them in fast and get the retorts closed, that it makes a great difference in the yield.

The coke is drawn down a chute into long wheelbarrows, directly over which we have water sprays. Each spray throws the water so as to wet all sides and bottom of the barrow. This prevents the iron from becoming too hot and being warped and bent out of shape. When the coke man, or No. 5 stoker, reaches the cellar after drawing his retorts, he immediately shuts the sprays off and does the rest of the quenching with a stationary water hose, of which we have one in front of each bench. Pails are not allowed. The coke man takes his coke over the elevator and runway and screens it, using a shovel to throw the coke on the screen, in order not to clog the same, as he is responsible for keeping it clean. When No. 4 stoker is through drawing he immediately loads his coal for the next round. Stokers Nos. 2 and 3 fire or break up the furnaces, depending upon the hour, and then clean up and look after the house, etc. No. 1 looks after exhauster, meter, pressure gauges, and quantity and quality of gas. All are through in about 30 minutes, except on the hour when they hook or clinker the fires.

All the coal or coke used is weighed upon retort house scales, and the foreman of each gang makes out a complete bench report at the end of the shift. When the coal or coke is weighed this weight is placed upon a blackboard and a ticket for the same (see Fg. 2) is also placed in a lockbox.

RETORT HOUSE COAL REPORT.

NIGHT.

To retorts.....	from	...
To furnaces	from	
From retorts.....	from	
From furnaces.....	from	
Coke to shed.....	Car.....	Boiler .....
Coke to R. H. bin.....	Bench furnaces	

Fig. 2.

The foreman makes up his bench report from the blackboard, while the tickets are sent to the office and there used as a check upon the report. The place from whence coal or coke is received is designated on each ticket and is of great assistance in accounting for the different stocks. If for any reason coal weighed is not all used, another ticket is put in the box giving the weight of such coal. This amount is also put on blackboard to be deducted by the foreman from his report. The ticket box is kept locked and tickets are removed by works' foreman or clerk. We insist on the reports and tickets agreeing, for only in this way can we get accurate figures to determine our results. The coke man puts a ticket into the box each round, showing where he took his coke. Under this system an exact record is obtained for the office of all material used or placed in stock. Our retort house scales are tested every month, with United States standard tests weights, and are balanced every day.

Now we come to a very important part of the work; that is, cleaning the standpipes. Each foreman has charge of the three pipes on one side of each bench. Every Monday each foreman burns out all of his standpipes. The caps of 6 retorts are opened up at a time, a few minutes before the time of that round on which they come is up, and all hands go after them. They first use the 5-inch reamer, and follow it up with a 6-inch reamer, and keep at them until the large reamer rattles up and down all of them; then they are scraped down from the top with a long, half moon scraper, the caps are immediately closed and they are ready for drawing and charging. It seldom requires more than 6 minutes to clean out 6 standpipes, but it often happens that Monday finds the pipes in very good condition. Nevertheless, they go at them and burn them all out; for it is only by keeping our system regular that we will get good results.

The foremen are responsible for the carbon in those retorts whose standpipes they have the care of. The night foreman puts in the blower and the carbon is taken off and the patching done during the day. Our crews change from day to night shift every second Monday, and thus each foreman has a chance to take care of the carbon in his own retorts by requesting the night foreman to place the blower for him. Burning our pipes and decarbonizing retorts, in order to get the best of results, must be done systematically with no let up, and, as in clinkering

benches, you must keep after your men all the time; or, in other words, remember, "Care for the benches."

The bench results at Jackson are not estimated, but arrived at by an accurate accounting of daily results. It has been in the past, and still is somewhat common, for gas men to estimate their fuel for benches. Estimates are something in this case that should not be used if there is any possible way to get out of it. I have little faith in the figures of works that do not weigh the fuel daily. My reasons for this are as follows:

First of all, an experiment is made for one or two, or possibly several days. When these experiments are made it is possible the bench was new and in very good condition, and the superintendent or one of his assistants was probably there directing the stoker in his work. It may be they had good fuel. It may be they had a good, clean fire box, or an especially good furnace man. Possibly they were charging exceptionally good coal. All of these things will help the fuel results and make them very good; nevertheless, they expect to use these results as their standard for figuring fuel used. Now where are we when we get new stokers who use anywhere from 5 per cent. to 20 per cent. more fuel than the old ones? Where are we, when we get poor fuel? And what is done when we have poor charging coal for a few days or a week and have to cut the charges and increase primary air and open the stack dampers? They go on using their experimental results on their reports, and there is no way to determine whether the fuel results are good or bad, or whether time is required in the retort house to train new stokers how to hold heats and fire economically. For these reasons I say that fuel results, based on experiments made during a short time, are of no value and should never be compared with the results obtained where the fuel is weighed day after day.

We figure the average charge per retort every 4 hours, without deducting anything for retorts decarbonized. This average charge is obtained considering 6 retorts per bench, 365 days a year, and all of our results are figured on the same basis.

Different methods of figuring are in part responsible for some of the wide differences in the results reported in various cities. Accuracy in accounting for fuel is desirable and necessary, if we are to do intelligent work. This is much easier than it looks at first. Have a convenient system for getting this done by your retort house men. They are not bookkeepers, and you don't want any guesses.

In conclusion, I sincerely hope my paper will benefit a few and aid in bringing peace to some of our operators. I am satisfied beyond any doubt we all will succeed if we remember "Care for the benches."

A Few Notes on Ammonia.

[A paper read by Mr. F. E. SHERIFF, of Battle Creek, Mich., at the Eleventh Annual Meeting of the Michigan Gas Association.]

Ammonia occurs more widely distributed than most of us imagine, but the principal source, and the only one in which we are interested, is its occurrence in and recovery from the gases obtained by the carbonization of bituminous coal. Most of the gas coal used in Michigan contains about 1.2 per cent. of nitrogen, which is equivalent to 29 pounds of ammonia per ton. In fact, few gas coals contain less than 25 pounds per ton, as shown in laboratory tests.

The chemical composition of coal is so complex that, to the best of my knowledge, no one has ever been able to analyze it thoroughly. Its elementary composition is, however, easily ascertained, as there is slight difficulty in finding out how much carbon, oxygen, hydrogen, sulphur, etc., it contains, but how these elements are combined is something that is left for some future chemist to discover.

We know that the best result obtained in gas works practice is the recovery of about 5 pounds NH_3 per ton of coal, which has to be extracted from 9,000 to 10,000 cubic feet of gas. This means that only 17 per cent. of the ammonia contained in the coal is recovered, and most works are very fortunate to recover this high percentage. What, then, becomes of the rest? An examination of the products of a coke oven plant using coal containing 1.3 per cent. of nitrogen, gave the following results:

	Per Cent.
Nitrogen found in the gas as free nitrogen	50.3
" found in the gas as ammonia	16.5
" found in the gas as cyanide	1.6
" found in tar	1.5
" left in the coke	30.1

While these figures are from a by-product coke oven, it is improbable the results will differ materially in a gas works using the same coal. No one has yet been successful in greatly increasing the ammonia production in the ordinary methods of coal distillation, but that it is not outside the bounds of possibility is amply demonstrated by the working of the Mond gas producer, which constantly gives from 19 to 25 pounds of NH_3 per ton of coal carbonized.

Anyone who succeeds in solving this problem of avoiding the "waste" of ammonia will add enormously to the revenues of the gas works, as even so small a yield as 5 pounds means from 25 to 50 cents a ton to be charged off from the cost of coal. As this 5 pounds per ton is derived from 9,000 to 10,000 cubic feet of gas, it might be well to glance at the apparatus used for extracting and collecting the same.

Besides the hydraulic main and condensers, various types of washers and scrubbers are used to remove this ammonia, and the solution finally obtained contains from 0.2 per cent. to 6 per cent. ammonia. None of this ammonia is actually free, but is combined with various impurities so that even when we have removed it from the gas and have obtained it in a solution, it is in too dilute a condition as well as too impure to allow it to be put to any practical use. Before going any further, let us examine some of this liquor. An analysis of a liquor containing slightly over 2½ per cent. ammonia, contained:

	Per Cent.
Ammonium bicarbonate	6.51
" carbonate	1.49
" sulphide	0.49
" sulphate	.32
" chloride	2.03
" sulphocyanate	.21
" thiosulphate	.17
" ferrocyanide	Traces

The larger portion of the ammonia is thus seen to pass into solution accompanied by carbonic acid and sulphur compounds, and in so doing performs a very desirable function in removing these impurities from the gas, as the former materially reduces the candle power, while the H_2S is such an undesirable and disagreeable constituent of illuminating gas that considerable expense is incurred in its removal.

The above list of the contents of crude liquor would almost raise doubts of the possibility of extracting the ammonia, but when we come to examine it critically we notice that the quantity of ammonia present as carbonate, bicarbonate and sulphide, technically called volatile ammonia, greatly exceeds that present in combinination with the fixed acids and which is known as fixed ammonia. The former is expelled from solution by the application of heat alone. For the latter heat alone is not sufficient, as the ammonia must first be liberated from the acid by means of an alkali—lime being almost universally used for this purpose. To return to the apparatus used in the extraction of this ammonia, we find ammonia first condensed in the hydraulic main. This is largely fixed ammonia on account of the high temperature of the liquor. This fixed ammonia can, however, be largely reduced, as is shown in the following instance:

At one works crude ammonia liquor was pumped continuously into the hydraulic to keep a liquor seal. The liquor from the overflow tested 44 per cent. fixed ammonia. At the other works, warm water was run into the hydraulic and the resultant liquor tested only 17 per cent. fixed. The total ammonia in the first case was .34 per cent. and in the second .336, both being practically the same.

The liquor from the condensers and tar extractor will be mostly fixed. On account of the large proportion of tar, I have been unable to get a sample and cannot give the exact proportion.

The next apparatus is usually a washer. This, in most cases, is fed with the liquor from the second scrubber. Not only is the liquor greatly strengthened, but much carbon dioxide and sulphuretted hydrogen are removed. In one particular instance the washer removed 27 per cent. of the total ammonia in the gas and strengthened the liquor from .833 per cent. to 1.9 per cent. It is no doubt a very efficient piece of apparatus and should be used where the liquor is saved for concentrating purposes. The next apparatus is the first scrubber, unless a rotary is used, which takes the place of both the first and second scrubber and sometimes the washer. The first scrubber is fed with liquor pumped from the separator or well and serves to strengthen the liquor and remove part of the impurities. The temperature of the gas will rise in going through this scrubber; this is due to the chemical action between several of the ammonia compounds and various impurities, such as carbon dioxide, etc.

A good filling for this scrubber is wooden trays laid crosswise. They are not only more easily cleaned, but the water or liquor is much better distributed. Liquor of .12 per cent. strength was pumped through this scrubber and raised to .89 per cent., at the same time removing about 50 per cent. of the total ammonia from the gas. The next apparatus is the second scrubber, which is usually the last employed for the removal of ammonia.

This, like the first scrubber, should be filled with trays or slats, and should have enough fresh water pumped through to remove all but the last traces of ammonia from the gas. Where the water is neither too cold nor yet too warm, 3 to 4 gallons per 1,000 cubic feet are sufficient. Liquor flowing from the second scrubber and testing .2 per cent. left no trace of ammonia in the gas perceptible to litmus paper, and removed about 20 per cent. of the total ammonia.

A rotary scrubber is much more efficient than the tower scrubbers, on account of the smaller amount of water used, the greater amount of impurities removed from the gas, and the ability to concentrate the liquor to a much higher per cent. Liquor of 6 per cent. has been obtained from these scrubbers without any trouble. At one plant a test was made and 47 per cent. of the carbon dioxide, 33 per cent. of the hydrogen sulphide and 99.8 per cent. of the ammonia were removed from the gas. This is a remarkable showing, and no doubt this particular scrubber will become more popular in the future, not only because of its efficiency but also by reason of the small space it occupies.

The 5 pounds of ammonia have now been all gathered in and lie in a solution in the well, varying from .2 to 6 per cent., the amount of fixed being anywhere from 5 to 25 per cent. of the total.

Too much stress cannot be laid on the necessity of keeping all drains, separators and wells tightly inclosed, as the air quickly oxidizes the ammonium sulphide into a fixed state.

I think the practice of introducing oxygen at the inlet of the exhauster has much to do with increasing the amount of fixed ammonia in the liquor, the oxygen acting the same on the sulphide as in the open air. It is to be noted that the amount of fixed ammonia in the liquor, in works where oxygen is introduced at the inlet of the exhauster, is nearly 7 per cent. more than where it is introduced after the scrubbers.

The next state is to convert the ammonia liquor into a marketable condition, which may be as concentrated ammonia liquor, sulphate, muriate or anhydrous ammonia. For concentrating purposes a liquor of less than 1 per cent. cannot be concentrated with economy. Any one of these products necessarily requires the distillation of the crude liquor, and there are many forms of stills in use—good, bad and indifferent.

I think we have all progressed beyond the stage of the plain, cylindrical boiler, direct fired with coal and intermittent in action, and realize that nothing can compare in economy and convenience with a distiller working on the bubble and spray principle using either live or exhaust steam as the source of heat.

A still to be efficient must be of ample size, and have enough sections so that all volatile parts of ammonia are removed before the liquor enters the sections for removing the fixed portions. The fixed still must be so designed that the liquor will have sufficient time to boil with the lime in order that none be wasted and that no more than a trace of ammonia appears in the waste. The liquor entering the still is usually preheated by the heat of the ammonia vapors or exhaust steam. Su h method is extremely desirable, as it makes quite an item in the amount of steam used.

The last state in the concentration is the collection of the condensed vapors in an apparatus called the condenser or absorber. This is one of the most important parts of the apparatus, and great care should be exercised in its operation or much of the ammonia will be lost.

A very efficient absorber is one patterned somewhat after a rotary scrubber, only set upright. By means of fresh water running in at the top, liquor of any strength not above 22 per cent. can be easily concentrated. Having at the top one or two sections containing fresh water it is impossible to lose any ammonia vapor passing off with the waste gases as is quite frequent with the absorbers in general use and on the market to-day. The liquor is now ready for the market and if your yield is not 5 pounds per ton you had better examine your apparatus.

Advertising as it Concerns a Gas Company.

[A paper read by MR. ALONZO P. EWING, of Detroit, Mich., at the Eleventh Annual Meeting of the Michigan Gas Association.]

In many lines of trade a well advertised trademark is the largest asset that a business concern has. Why, then, is it not legitimate for a gas company to charge a portion of the advertising, which brings to them the same kind of results as the work of the solicitor to construction? In coke sales, for instance, if you make a certain brand upon your coke—such as the word "Genuine" gas coke—and expend thousands of dollars during the course of a few years in securing a trade for this particular article, is not the word "Genuine" in itself of sufficient value to you to be an asset? We make mention of this, because oftentimes companies charge the entire amount for advertising to expense rather than a portion at least to construction.

If you could meet your entire trade personally, and could explain to each the merits of all your different goods, you would not need to advertise. You can't do this. As a matter of economy you advertise—tell the public what you have for sale. Each year additional business will result. It makes it easier to do business; less work and worry—more satisfaction all around.

If you are satisfied with just "keeping store," don't advertise. If your blood is red, if you want to grow, if you feel a satisfaction in being a leader in your line—advertise. Do it right. Make it a feature of your work, not a side issue, and the cash assets at the end of each year will surely determine the value of advertising. The net earning of a company is the all important goal.

A small company can better afford to advertise than the larger companies, because it is so much less expense to reach all of the possibilities. You cannot only talk with the most of your trade, but you can reach all of them by a little good advertising.

In this day and age the gas companies all over the country are using every effort to educate the public to use more gas in an economical way. Companies spending enormous sums for new business, making charges to construction account, oftentimes do not receive a good return the first year. We cannot say it is not good business, for eventually it reaps an enormous harvest. Are we overlooking the fact that the man who is using but 30 cents' worth of gas per month could be induced to use the many gas appliances that are on the market to-day if he were but familiar with their use? We have, for example, the portable gas reading lamp. It burns the most hours of any lamp in the house. The man who is using a large oil lamp, not knowing that he can get a more satisfactory light, a better light, and a more economical light by the use of gas, has not been approached in the proper way—advertising.

Who can say advertising doesn't pay? Is it not the duty of every gas company to lay aside each year an amount of money to be used *pro rata* for all the different expense accounts, or is it an error to lay aside a given quantity of money in proportion to the size of the plant, and charge to construction account under new business the same as in the expense incurred in securing new business through the distribution department?

Gas managers and gas presidents to-day recognize the advertising man of the gas company as of the same value to the company as the man who is at the head of the new business department, or the superintendent of distribution, or the superintendent of manufacture, and why not? Is it not through his ability and ingenuity that greater volume of business can be secured at a less cost than in any other department?

You can reduce the price of gas in your manufacturing department by securing a greater revenue from your coke. Your superintendent of manufacture may reduce the price of gas through his knowledge of the manufacturing industry; or in another way, the man who advertises for the gas company may secure 50 cents per ton for your coke, and thus make a greater credit to manufacturing and a less cost per 1,000 made. One company in mind figured that a small increase in the price of coke would decrease their cost in the holder 10 cents per 1,000. We all have had the same experience with other residuals, such as tar, as a means of reducing our cost of manufacture. Suppose you are receiving but 3 cents per gallon, and through the expenditure of 1 cent per gallon on the tar manufactured by your plant in one year in advertising you receive 5 cents per gallon for all tar made. You have gained 1 cent, which should be credited to the advertising man. It will go to the credit of manufacturing. He may also be the salesman, and as the salesman and advertising man he brings results that the manufacturing superintendent could never accomplish. So much for reasons why we should advertise; and now about methods to be employed.

The newspapers are our friends. Have you ever thought how much good the newspapers could do you in the eyes of the people by simply acknowledging in their local columns the quality of gas you are distributing? It makes a better feeling. Through the newspapers we are popular with the public. Let us cultivate their friendship. We believe that if the newspapers spend with our company $5,000 a year, we should not spend less than that amount with those papers for advertising, and it would seem we should spend much more, because we have an enormous quantity of residual to dispose of.

As a minor illustration of what a newspaper can do for a gas company, I recall one special sale in which 1,000 portable lamps were offered at a price that would almost cover the advertising expense plus the total cost of the lamp. A neat, substantial, well-fitted portable lamp was purchased of a manufacturer, giving him ample time to make it during the quiet season, and 1,000 were purchased at a very much less price than a smaller number could have been bought for. One hundred dollars were spent in the newspapers, and during a period of approximately 2

weeks the entire number of lamps were put into as many homes. Think of it! At no expense to the company, or at 10 cents each for advertising, 1,000 good appliances were put into homes, and the actual records on the cards show an increase in the gas used by these separate families more than equal to the actual cost of the lamp itself. Can any business be obtained easier? Can you increase the net earnings any easier?

We have, for example, the arc light that has revolutionized the store lighting in the past 3 years. During that period 150,000 Humphrey lamps have been hung in the United States, and I would venture to say that in most cases at absolutely no cost to the companies. The increase in gross revenue actually shown on the records of any company who cares to examine the account of individual consumers will be an average of $35 to $50 per year. There is a class of trade, such as saloons, that will use an amount of gas equivalent to $75 per year per lamp. These figures reach $100 in some dark saloons where the lamps burn all day and until 1 o'clock in the morning. Let us wake up to the fact that when we can increase our net earnings through the advertising department, and sell such appliances, it is a golden harvest.

Take any appliance, for example the water heater. The increased number of water heaters placed in the homes has added to the net earnings of the company in the same proportion as has the gas range. During the past year among three or four of the manufacturers 150,000 circulating water heaters have been placed in the larger cities. I have not had time to go into the details of the schemes used to bring about this result, but suffice it to say it was largely through advertising. I will come a little later to some of the methods employed by gas companies other than newspaper advertising, and I feel that no manager can overlook the enormous profit to be derived by a little additional thought and care in this department.

The gas bill goes into the hands of each and every one of your customers once every month. Did you ever think that your customer was obliged to read that gas bill? It should be your greatest care to give him all the information possible. On the back of the bill is some valuable space, and you will find if it is used with care that it will bring you results not dreamed of. We use a sticker on the front of the bill, and I give you some samples.

Our proposition to the public in one of these little advertisements was for a free heater. We, however, charged $1 for the connections. We spent $30 advertistng with these stickers, and in one week's time had put out 1,000 heaters, as a direct result of this small expense. We were obliged to buy an additional 500 for this sale, which we thought would stop at 1,000.

We know what the heater means to a man at his home for use in his bath room or living room, and if you take the trouble to examine that man's account after having given him one heater, you will find that your money has come back to you four-fold.

Pamphlets are a valuable means of advertising, and as most gas companies to-day have addressing machines, that give the names of their consumers on the different lines of mains, it is a simple matter to address one of these pamphlets to every customer.

A house piping proposition may be carried on entirely by this means of advertising with a result worthy of consideration. Increase your advertising and the results will show in proportion. Cannot your company afford to spend 10 cents to put a home reading lamp on the table of its customer?

The envelopes that are used by either large or small companies have valuable space as an advertising medium. This is no supposition, but a fact. I have tried it and found that our envelopes cost us little, in fact less than nothing, when their advertising value is considered. It is easier, of course, to buy the regular stamped envelopes, but a few minutes' thought on the part of the advertising man will bring you profitable results.

For your coke business, a pamphlet giving your customer every possible information as to how he should use coke to get the best satisfaction is a valuable bit of advertising. In this you should tell him how to kindle a fire, how to keep a fire over night, how to tell whether he receives good measure, and also give him a list of "Don'ts" You will inspire confidence in this way that it might take a dozen solicitors to do for you.

Does advertising pay? In the United States $600,000,000 are spent each year. Do you suppose that active business men are throwing money away? Is not the gas business to be compared with any manufacturing business of which we know? If we are to obtain good results, why is it not to our interest to spend money in order to secure them?

You pay a good price for your superintendent, and he makes gas so that you can afford to sell it at a low price, but unless you sell it in quantities you are not making money. The quantity is what counts, and if you will have with your company an advertising department, no matter how small, the results will show an ample reward for your efforts.

I have tried to be general in my remarks rather than to go into details, for I think there is ample room for a paper on each kind of advertising.

The different methods to be used for pushing the sale of any one article, such as coke, water heaters, or arc gas lamps, would each constitute interesting matter for a separate paper.

[Prepared for the JOURNAL.]

Something New Concerning By-Products Obtainable in the Purification of Coal Gas.

By MR. FREDERIC EGNER.

One of the obtainable by-products resulting from purification of coal gas is cyanogen (Cy). A primary method for its recovery is described on page 274 (AMERICAN GAS LIGHT JOURNAL, Feb. 16th, 1903). But as the demand for cyanogen is limited, because its principal use is confined to the "cyanide process" of gold extraction, and as that demand, of a comparatively modern date, was quickly met by an overproduction of cyanide, it does not seem to be worth while to bother with it now, notwithstanding a recent statement from another source to the contrary. Although it has also been pointed out that the presence of cyanogen in illuminating gas served as a material aid to corrosion of the inside of gasholders, main and service pipes, it will be doubtless some time before the worry of American gas engineers will be great enough to be noticeable on account of this fact.

It has been proposed to work over the cyanogen, recover from it the nitrogen which it contains, and convert this into ammonia sulphate; but that this would prove a commercially profitable operation has yet to be demonstrated.

It is quite different with ammonia, however. Ammoniacal liquor forms, as we all know, a considerable source of revenue to coal gas works of dimensions large enough to enable them to employ the apparatus required to date. Few plants indeed are supplied with apparatus to convert the ammonia recovered into sulphate of ammonia, which consists of 25.89 per cent. ammonia, 60 53 per cent. of sulphuric acid, and 13.58 per cent. of water; costs about $19 to $20 per ton to produce, and sells on an average for about $60 per ton. At some of the works the liquor is pumped to nearby ammonia and tar factories, while at others concentrators are used, making it possible to ship the concentrated liquor to factories where it may be worked up, in that manner yielding at least some revenue. The small works as a rule cannot afford to utilize the material in this way, therefore, it is lost. Consequently it must be interesting for owners of smaller works especially to be informed that a German scientist announces he has discovered a method by means of which even the smallest coal gas works may work up the ammoniacal liquor right on their plants into a salable and profitable article; viz., nitric acid. The inventor is Herr G. Hofrath Ostwald, Director of the Physical-Chemical Institnte of the University of Leipzig.

Herr Wunder, of Leipzig, is authority for the statement, taking the recent prices of sulphate into consideration, that there would be a considerably better profit from the nitrogen obtained in gas manufacture if it were converted (supposing there were no mistake in the learned Professor's theories) into nitric acid rather than into sulphate of ammonia. The Professor was reminded that it was not likely that the large ammonia works would be abandoned and that the owners thereof would take up the newly discovered process instead; and it was right here where the inventor made the statement it was with an especial view that the many small works might profitably take up the matter that he had designed his apparatus, which he said was small and simple.

It was also pointed out that the action of nitric acid on metals might seriously handicap profitable operations with his plant; but the Professor met this objection by stating he has succeeded in producing a combination metal which was able to resist the acid perfectly, and was not at all affected by it. It may be premature to rejoice over this discovery, but men of such scientific standing as Professor Ostwald and Herr Wunder are not likely to jump at conclusions, or to go off, as we say, "half cocked" when they make any public statement.

The importance of nitrogen to mankind is understood by the comparatively few. However, gas managers need not fear that whatever may be accomplished by the process (or any other as yet existing) mentioned that this would result in a really material reduction in the price of the article containing the available nitrogen which might be produced. The demand, unlike that of cyanogen, is practically unlimited, because land must be fertilized to produce crops. A noted American agricultural scientist, Professor Atwater, remarked a few years ago: "The great want of agriculture at the present day is nitrogeneous manures or fertilizers. It is the most costly element that the farmer has to buy. Four-fifths of the atmosphere around us is composed of nitrogen, and the man who discovers a way of obtaining it from the air at a small expense will be the greatest material benefactor that the world has ever produced." Now, between what might be thus produced and what is possible to obtain out of all the gas and coking works in the world, there is an immense margin. And right here gas managers

might with advantage make note of another fact, viz.: Why is it that at gas works as a rule we can get only enough ammonia to produce from 25 to 28 pounds of sulphate per ton of coal carbonized? while in the Mond process 90 pounds of sulphate are given as that obtained from a ton of coal. The writer has not yet learned that Mr. Mond claims to have discovered the synethetical production of ammonia, which Prof. Atwater designated as such a desideratum; but if it can be obtained by the Mond process, why not in the ordinary coal gas process? This is not to be understood as implying anything else than the thought that here is evidently something which some of our young, bright and collegiate superintendents of gas works might look up and maybe determine much to their and the world's benefit.

[Concluded from Page 246.]

The Didier-Stettiner System of Inclined Retorts in England: Its Installation at Plymouth, and Other Works Extensions and Improvements.[1]

One other part of the retort house equipment yet remains to be dealt with, and that is the coke plant. A De Brouwer (2 feet 6 inches wide) conveyor has qeen adopted (Fig. 10); and the mere mention of the name is sufficient description. From the house the conveyor inclines upwards in the yard, and delivers into coke hoppers of 160 tons capacity (Fig. 14),

Fig. 14.—The Inclined Coke Conveyor and Hoppers.

which is about equal to 2 days' production, and so tides the work over Sundays. In its delivery to the hoppers the coke falls on to diagonally fixed bar screens, through which the breeze drops; the coke being carried by a conveyor without further separation into sizes, into the other hoppers—there being no sale for assorted coke at Plymouth. The hopper conveyor is fitted with doors over each hopper, so that the coke can be placed in any one as desired. From each outlet of the hoppers the coke falls on to another inclined screen, from which it is bagged. The whole plant is driven by a gas engine arranged below the floor of the retort house.

The quenching of the coke is commenced by roseheaded sprinklers fixed to the buckstays, and further in the usual manner (which forms a feature of the De Brower patent) at the bend where the coke passes from the horizontal to the inclined portion of the conveyor. A noticeable feature of this end of the conveyor is the tunnel shaped steam chimney for carrying the steam from the quenching place (which is inside the retort house) some distance up the slope outside, so as to keep the retort house as free as possible from steam, but more particularly to assist the thorough quenching of the coke. The steam passing through the inclined tunnel appears to keep all air from the coke, and puts out the flame perfectly without requiring the coke to be so saturated with moisture as to be in any way damaged. Another feature of this method of quenching the coke lies in the fact that the steam quenched coke leaves the conveyor at a high temperature, and has sufficient heat in it to evaporate any moisture which may be in the pores of the coke; the resulting sample of coke being clean and silvery to the eye, and satisfactory from all points of view. We are informed that the improvement made in the De Brouwer conveyor since its introduction in England has brought the production of breeze down to a very slight point, and that this result has been accomplished by great care in handling the coke after it leaves the conveyor. Mr. Hoyte regards as very moderate the amount of breeze that is produced at Plymouth.

This completes the description of this interesting retort house; but we cannot leave it without a few complimentary words as to the character of the work. From base to roof, and all that there is within and outside the house but connected with it, constitute in the whole a piece of work of which all associated with it in any way may be proud; and not only they but the company who are now the possessors. The house has not yet been in operation a clear two months; and therefore it is too early to speak of working results. But it is an interesting item of intelligence, which we have Mr. Hoyte's permission to publish, that already they are carbonizing in this house at under 1s. per ton of coal including everything—from the taking of the coal out of store, the men on the drawing and charging stages, and the coke and exhauster men. There are two men on the charging stage and two on the discharging stage, working 8-hour shifts. This is good, remembering that there are 72 retorts, that the charges are 5-hour ones, with 7 cwt. to the charge, and that less than two months ago the men had only been at work on horizontal settings. Considering this, they are doing remarkably well on the inclines; and, in a short time now, it is apparent all little roughness of movement caused by the change of work will have worn off, and greater alertness will almost unconsciously ensue. As to the working of the retorts, Mr. Hoyte states they started off with the minimum of hitches, and that though they have only been in use for a few weeks, the results have come quite up to the expectations that his Chairman and Board and himself anticipated after what they saw at Mariendorf. The charges in the retorts were observed, on the occasion of our visit, to be as level as charge was ever laid in a retort; and several of the spent ones were seen to tumble out of the retorts in a perfect mass, after the release of a few inches of the charge lying near the mouthpiece. The coals that are now used at Plymouth, it may be of interest to the reader to know, are Peareth, Dean's Primrose, and Townley Main. Another point that cannot fail to impress the visitor is the remarkable rapidity with which, during the drawing and charging, the smoke and steam pass away directly upwards, which is the proof of the efficiency of the special construction of the house with the view of securing as near perfection in its ventilation as the circumstances will allow.

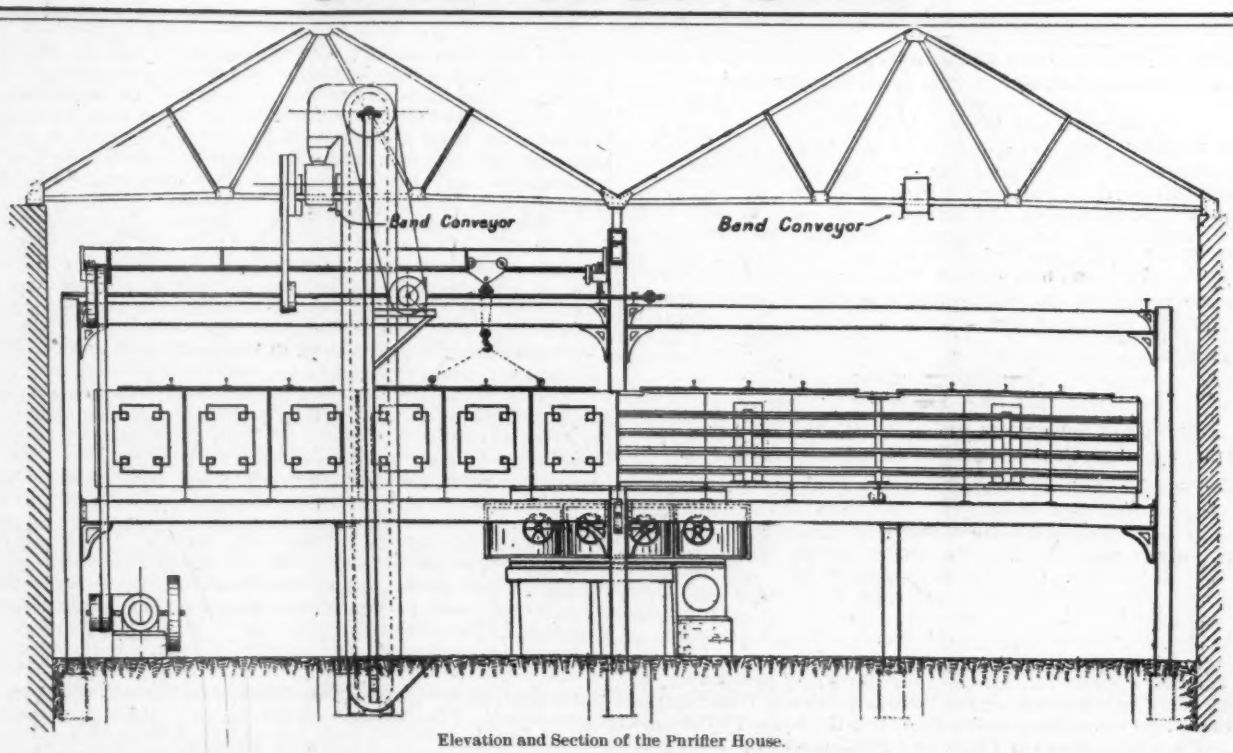
Exhausters, etc., and Water Gas Coke Plant.—There are a few additional portions of plant which claim notice. It was mentioned, when generally outlining this scheme of works improvement and extension, that the old No. 3 retort house has been converted into an exhauster and washer and cyanide plant house. At one end of the building, in connection with the new incltned retort house, there have been installed a duplicate set of exhausters, of 70,000 cubic feet per hour each; and space is left for a futher two sets for dealing with the second half of the house when necessity demands its erection. There is also a new Livesey washer near by, of a capacity of 1½ million cubic feet; and provision has been made alongside for an additional one for the next installation of inclines. As soon as things settle down, the house is to be partitioned, so as to separate the cyanide plant from the new machinery; and the portion allotted to the latter is to be tiled, and put into the respectable condition in which one expects to see such rooms.

A new station meter of 125,000 cubic feet per hour capacity (dealing with the whole of the coal gas plant) has found a temporary habitation in a shed. Future work embraces the clearing away of an old small holder, known as No. 3; and on the site is to be built a new governor and meter house. The governors at the present time are dotted about the works; and the proposed new house will permit of their collection and manipulation under one roof.

In connection with the Cutler carburetted water gas plant (which consists of four sets of 750,000 cubic feet each), an introduction is being made which will effect economy in the handling of material. At the present time, the generators are fed by coke brought from the retort house in bogies, holding about 5 cwt. each; and these have to be raised by a hydraulic lift to the operating floor. The plant that is now being put in will simply involve the carrying of the coke in bulk from the yard coke hoppers, and shooting it into a hopper outside the water gas house. From there, it will be raised by a De Brouwer conveyor (set at an incline of about 40°, and of 20 tons an hour capacity), which will deliver on to a cross conveyor inside the house; and this, in turn, will feed the coke into four hoppers of 12 tons capacity, situated over the generators.

The New Purifying Plant.—We have now come to the last, but not the least important, of the extensions embraced within the scheme under notice. This is the new purifying plant for the carburetted water gas; the old water gas purifiers, in the changes made, having

1. *Journal of Gas Lighting.*



Elevation and Section of the Purifier House.

been allocated to the new inclined retort house. The set of four new boxes have been installed in the building adjoining those in which the old ones are situated. They are 30 feet by 35 feet by 5 feet deep; and of the luteless type, worked by a 24-inch Pickering valve (Figs. 15 and 16). This valve is the largest of the kind that has been made up to the present. It works without any connections; being simply bolted to the bottom of the purifiers. Any combination of boxes can be worked by it in rotation; and Mr. Hoyte testifies that it is very simple in its operation. To this valve there is only one inlet and outlet pipe. To return to the purifiers themselves, each one has four covers, and these can be raised two at a time by a travelling crane (Fig. 17). The boxes (which are fitted with 4 tiers of sieves) are supported on a superstructure formed entirely of rolled steel joists; and the center and outer uprights have been extended to carry the roof and the travelling crane. There are two sets of elevators and conveyors, driven by a steam engine, for handling the oxide. The house is lighted by a small electric light plant laid down by the contractors. From this brief description, it will be seen that the new purifying plant is of a very complete character.

Fig. 15.—Purifier House and Pickering Valve.

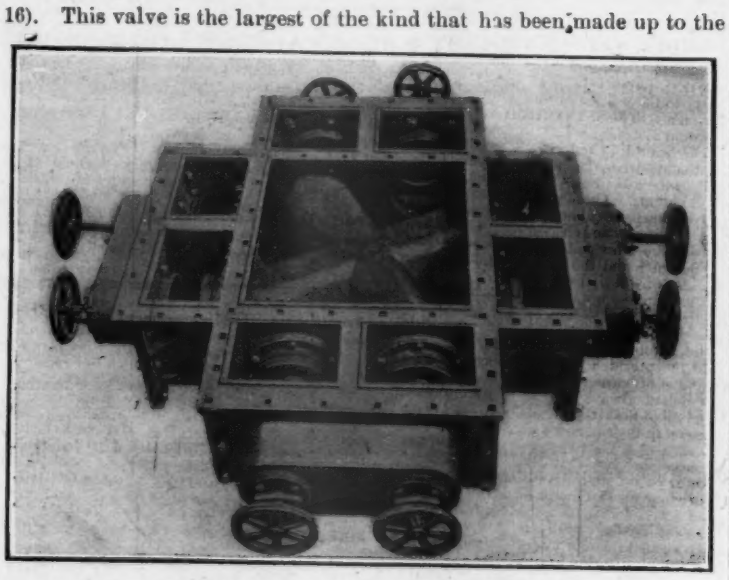


Fig. 16.—Interior View of a Pickering Valve.

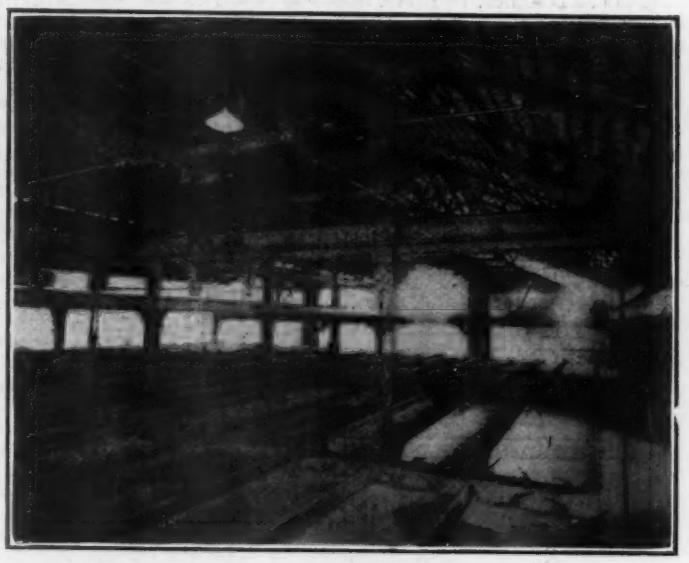


Fig. 17.—Purifiers, Showing the Conveyor and Travelling Crane.

The large scheme here described was only started in October, 1902. In July last, the purifiers were in operation; and in little more than 12 months the entire plant—excepting the coke plant for the water gas generators—was in full use. Considering the very heavy character of the work involved, more particularly in the retort house, excellent expedition has been displayed by Messrs. Willey and Co.; and the work generally as finished cannot fail to command the approbation of all engineers who may have the opportunity of inspecting it. It is apparent from the work put into the Didier-Stettiner settings that, in point of strength and quality of material, it is the intention of the firm that they shall be second to none. Time must, from results, tell the tale of their working; but the present experience has given great satisfaction to the Chairman and Directors and the Engineer at Plymouth, and it will doubtless be found that their confidence has not been misplaced.

Advantages of British Gas Legislative Enactments Compared with Those of the United States.[1]

[Communicated by MR. JOHN WEST.]

It may be interesting to many readers of the *Journal* if I relate an incident in connection with a large gas undertaking that came to my notice when journeying in America.

In 1902 among other places, another gentleman and myself visited the city of Cleveland, and called upon my old friend Mr. Greenough, formerly of Boston, and a gentleman well-known and highly respected by many gas engineers in this country—he having attended several meetings of the Gas Institute. He now occupies the important position of President of the Cleveland Gas Company. He was very pleased to see us; and, after inspecting his large works, we learned that he had called together most of the gas engineers in the immediate district to entertain and pay honor to his visitors during the evening.

At this happy gathering, as will be imagined, we discussed gas matters pretty generally in connection with the New and Old Country. I gathered that the Cleveland Gas Company at the time was in a very prosperous condition, having had large increases for many years past in the consumption of gas for cooking, heating, and lighting purposes; and the President was then considering the necessity of extending his plant, so as to meet the probable increased demands and requirements in this large and prosperous manufacturing center, which contains about 425,000 inhabitants. The gas supplied was of about 18-candle power, and was sold to the consumers at 75c. per 1,000 cubic feet, which is a very low figure for America. Something like 15,000 cooking stoves were fixed; and the Company was exceptionally busy in this department—in fact, as I have said before, everything in connection with this important concern appeared in a most flourishing and prosperous condition. But there can be little doubt that at this very time arrangements had been, or were being, made to attack the town by the emissaries of the great Standard Oil Trust, as I learned shortly afterwards that an application had been made for authority, which, unfortunately, had been granted by the Municipality (through the special influence of the Mayor of the town), to supply natural gas to the city for cooking and heating purposes only. Although Mr. Greenough addressed the Council on the subject, and tried in every way to prevent this introduction, he was unable to do so.

There is no natural gas in the immediate district. Therefore, it could hardly be expected that this gas would ever become a competitor in Cleveland. Distance, however, does not appear to have been a barrier in this case; for the Standard Oil Trust have, at considerable expense, laid down pipes for the transmission of the gas between West Virginia and Cleveland—a distance of no less than 208 miles. These pipes are made of steel, and are 16 inches in diameter; the gas being delivered through them at a pressure of about 250 pounds per square inch. It is then reduced, in high pressure mains, to about 25 pounds per square inch, and is finally brought down by governors to about 4 oz. pressure in the distributing mains. To my surprise, I found, when visiting the city, about 3 months ago, that some 300 miles of mains for supplying the natural gas had already been laid.

This natural gas, as many readers are well aware, is of a much higher calorific value than ordinary coal gas, and is supplied for heating and cooking and manufacturing purposes only. It is inodorous, and deadly poisonous; and therefore of considerable danger to those who use it. This was a point that was strongly urged by Mr. Greenough when before the Council. The gas is being sold at the present time at 30 cents per 1,000 cubic feet; and this low price has induced a considerable number of the old Gas Company's consumers to go over to the new one. And who can blame them (if they care to take the risk), when they can get gas of so high a calorific value for heating and cooking purposes for less than half the price? But what is the effect? The introduction of the natural gas has completely stopped the former annual increases of the old Company; and, at the present time, considerably less gas is being supplied by them than formerly. I am sorry to say that the value of the Cleveland Gas Company's shares has already declined.

The question arises as to what will be the ultimate issue and advantage or disadvantage to the consumer, arising out of the severe competition between the East Ohio Gas Company (which is a branch of the great Standard Oil Trust) and the Cleveland Company. It may be said by some advocates that the introduction of the new venture will be a good thing for the consumer. This may probably be the case for a period; but, in my opinion, it is questionable as to how long the advantage may last. Looking back upon our past experience in this country, we can judge by what has formerly taken place—especially in London, where, in the earlier years of gas lighting, several different gas companies had mains running side by side in the same streets, and competing severely with each other—the consumers changing from one company to another as the price varied. We know that the frequent disturbance of the streets which necessarily occurred under this competitive system became intolerable, besides which the running of several mains through a thoroughfare, when one would suffice, was responsible for a reckless waste of capital.

Small wonder, therefore, that the Legislature interfered, and eventually decided it would be far better that only one company should supply gas within a given and restricted area. Looking over the rules and regulations embodied in Acts of Parliament—stipulating the amount of capital, price of gas, illuminating power and dividends to be paid—and taking into consideration the history of gas supply since those competitive days, there is no doubt that these properly regulated and restricted monopolies have in the main answered admirably, to the advantage of both the investors in gas companies and the public generally. There is a kind of copartnership between the companies and the consumers, whose interests are both protected by the Legislature; and I feel sure that, when the authorities in America get more enlightened on the subject, we may anticipate that only one system of supply will be allowed or tolerated in each town—in other words, that a properly ordered and regulated monopoly will obtain, which, if satisfactorily arranged, must be an advantage to all parties concerned.

At the present time in America, where each State makes its own laws, the majority of them are so arranged as not to protect monopolies. The result is that most of the gas companies have to run the considerable risk of unnecessary competition, as well as the peculiar whims and fancies of the local political authorities, who are ever changing, and who generally try to make some monetary advantage wherever they can.

I found that the Cleveland Gas Company paid the corporation the extraordinary sum of 6½ per cent. upon the sale of gas; and this is undoubtedly done with the idea that the corporation will do their best to protect the Company, though they could not make any definite promise to do so, as the State laws do not lend their support. Seeing that the Gas Company pays the municipality 6½ per cent. on their takings for gas, it might be interesting to know what monetary arrangements have been made between the representatives of the Standard Oil trust and Mr. Johnson, the Mayor, to recoup them for the loss of the 6½ per cent. they will sustain through the reduced receipts of the old Company.

It appears to me that there is no end to the possibilities of this sort of thing. There is no reason why another illuminating gas company should not, under present conditions, go to Cleveland, inasmuch as they would only have to submit their franchise to a popular vote as well as to the city government; and there is little doubt that they would succeed if they had power and influence enough. This would bring a third party into the arena; and then there would be more fighting and capital squandered. The strongest would be then left in possession; and who but the public would be called upon to pay their little bills.

There is, however, the State of Massachusetts, which seems to be more advanced than the other places in regard to this question; both the gas and electric lighting companies being protected in the State to this extent: There is a Commission (appointed by the Governor) to whom the companies have to make returns of their business, and who have control of the prices charged by them. A competing company would have to secure the assent of the Commission before it could do business, as it protects gas and electric light companies to this extent.

Some of the gas companies, like some of the large trusts in the States, are very much over-capitalized or valued; and this, of course, prevents gas engineers selling gas cheaply. This system of "watering" in the great trusts in America is, in my opinion, doing an incalculable amount of harm to the country. Mr. Carnegie (who is noted for giving advice) admits that they will have to squeeze some of the water out of these trusts. It struck me when reading this remark that it would have been much better if he and those connected with him had never permitted the great Steel Trust to have had such a deluge of water poured into it, which has already caused the ruin of a large number of the shareholders.

It is said that it is a good thing to see what other countries are doing, and how they manage their affairs. During my visit to the States, I certainly was impressed with the advantages of some of the educational methods and workshop practice; but, when judging their ways in connection with gas and electric light company enterprise and practice, and especially in connection with the gas supply, I felt that the system adopted in Great Britain is very far in advance of theirs. All gas companies with Acts of Parliament in Great Britain should feel glad that they are in a country where there is greater security and protection for their investments, and that these regulated Acts of Parliament are of considerable advantage to the public generally.

[Mr. Greenough last summer was very much upset by bereavement in his family; and he visited Europe to recruit his health. When last I saw him he had not fully recovered. But I heard from him a few days ago, and his friends will be glad to know that his health has been fully restored.]

1, *Journal of Gas Lighting*,

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

OUR advertising columns show that Mr. George G. Ramsdell has severed his connection with the Connelly Iron Sponge and Governor Company, and has opened an office at 530 Broadway, New York, where he continues his agency for the Drake system of inclined retorts, the Roots' exhauster and other gas works apparatus. It is a sure thing that in his new quarters his welcome for visiting gas men will be cordial and sincere.

MR. M. E. MCCASKEY has been appointed receiver for the properties of the Lawrence Gas Company, of New Castle, Pa.

MR. C. O. G. MILLER has resigned from the executive committee of the San Francisco Gas and Electric Company. His successor is Mr. Homer C. King.

AT the annual meeting of the Salem (Mass.) Gas Company the following officers were elected: Directors, Henry A. Hale, John H. Smith, Charles F. Prichard, S. W. Winslow and A. W. Rogers; Treasurer, B. W. Sluman.

THE Hon. Stukes Whiton, formerly Chairman of the Massachusetts Board of Gas and Electric Light Commissioners, died at his home in

Hingham, Mass., the afternoon of the 12th inst. He was in his 75th year, having been born in Hingham, April 11th, 1829.

MR. ALEXANDER ROSS has resigned his position as Secretary and Treasurer of the Laclede Gas Light Company, of St. Louis, Mo. The new executive staff of the Company is as follows: President, E. W. Wetmore; Vice-President, Breckenridge Jones; Treasurer, C. A. Tucker; Secretary, C. L. Holman; General Manager, E. G. Cowdery.

ACCORDING to the Cleveland (O.) *Plaindealer* City Auditor Madigan early this month received from the two local gas companies "the sum of $48,869.73, being a semi-annual payment of 6½ per cent. of the gross receipts of the companies. The Cleveland Gas Light and Coke Company paid $38,111.44 and the Peoples Gas Light Company paid $10,758.29. The money will probably be placed to the credit of the lighting fund, as it was appropriated to this fund by the general appropriations ordinance passed two weeks ago. It was originally intended that this money from the gas companies should go to the general fund for the purpose of erecting a new city hall, but City Solicitor Baker is inclined to doubt that this is binding. Auditor Madigan will ask Mr. Baker for a definite opinion as to where to place the money."

MANAGER BOWEN, of the Kenosha (Wis.) Gas and Electric Company, has given notice that, beginning with the 1st inst., the following selling rates are to rule: For the first 5,000 cubic feet per month, $1.50 per 1,000; for the next 5,000 cubic feet, $1.20. All in excess of the last named quantity, $1 per 1,000.

MR. MARTIN V. WOOD, of Hempstead, L. I., has resigned the Presidency of the Hempstead and Nassau County Gas Companies. Mr. J. T. Seaman has been appointed Superintendent to the Companies, vice Mr. V. W. Duke, resigned.

A CORRESPONDENT in Augusta, Ga., writing under date of the 9th inst., forwards the following: "Mr. Augustus Barie, who claimed to have shaken hands with General Lafayette, when that distinguished Frenchman visited Augusta, died some days ago at his home in Savannah, Ga. Mr. Barie was born in Augusta, September 10, 1816, and his death was caused immediately from an illness resulting from a fall which happened about 4 months ago; but in a general way he had suffered for years from debility. During his long life Mr. Barie followed various pursuits. He was for 15 years the bookkeeper of the Savannah Gas Company. For a number of years he was with the banking house of Hiram Roberts. For the past 15 years his advanced age has precluded his active participation in business life. He was a veteran war member of the Savannah Volunteer Guards."

THE Otis Company, which supplies all the gas used in Ware, Mass., announces that a reduction in the selling rate will shortly be ordered, likely before the 1st of April. The present rate is $2 per 1,000, and the belief is that it will be cut to $1.50.

IT is declared that all the preliminaries respecting the merging of the Shippensburg (Pa.) Gas Company and the Electric Light and Power Company of the same place have been completed. The new concern is to be known as the Shippensburg Light, Heat and Power Company.

MR. GEORGE PHILLER has resigned the First Vice-Presidency of the United Gas Improvement Company, and Mr. Samuel T. Bodine succeeds him. Mr. Randal Morgan goes on to the second place, and Mr. Walton Clark to the third. It is understood that the vacancy on the Board of Directors, occasioned by the death of Mr. William L. Elkins, will be filled by the appointment of Senator John Dryeden, of New Jersey.

AT the annual meeting of the Muskegon (Mich.) Traction and Lighting Company no change was made in the executive management. It was decided to expend the sum of $40,000 on plant betterments, the main item in the schedule being the construction of a new storage holder.

THE Bay City (Mich.) Gas Company and the Bay City Traction and Electric Company have jointly leased for 12 years the west half of the ground floor in the Bedotto Building. The premises will be refitted, and when the refitting is done the named Companies will easily have the finest office quarters occupied for business purposes in Bay City.

AT the annual meeting of the shareholders in the Zanesville (O.) Gas Light and Coke Company the officers chosen were: Directors, M. M. Granger, Alex. Grant, Chas. H. Abbott, R. Fulton and Eugene Printz; President, M. M. Granger; Secretary and Superintendent, Eugene Printz. Mr. Printz succeeds Mr. G. A. Allen as Secretary, who resigned because his health was such as to render his action necessary. He served the Company faithfully and well for 20 years. Mr. Printz has been in the Company's employment virtually since 1865.

THE stock of the Red Oak (Ia.) Gas Company, which had been controlled by certain "capitalists" of Independence, Ia., has been taken up by local interests. The new President of the concern is Mr. A. R. Tracy, and its Secretary and Treasurer is Mr. H. W. Shank.

AT the annual meeting of the Peoples Gas Light and Coke Company, of Chicago, the report submitted by President George O. Knapp, concerning the operations of the Company for the past year, after noting the Company had been successful before the Supreme Court of Illinois in sustaining the legality of the Company's consolidation, and stating that the question of the city regulating the price of gas is before the United States Supreme Court, continued: "Notwithstanding a marked increase in the cost of labor and materials, and a more or less adverse condition of affairs, due to a strike among the employees, and a diminished supply of gas, the Company has prospered. The earnings for the year exceed those for 1902, which were the largest, up to that time, in the history of the Company. Something over a year ago the Directors concluded to take up the matter of pushing the introduction and installation of what are known as gas arc lamps, and the total number of these lamps now in operation is 28,477. A careful record of the operations of these lamps indicates that the consumption of gas by an arc lamp is substantially the same as the consumption of the average family gas stove. The increase for the year in the number of gas meters set is 5,000, and in the number of gas stoves installed 19,337. The increase in the number of meters and gas stoves set and installed is not so large as during the year 1902, due to the fact that for a considerable period, during the strike, the Company could not install meters and gas stoves with the same facility as prior to, and subsequent to, the strike of its employees. However, whatever deficiency exists in this department is more than compensated for by the number of gas arc lamps installed. The increase in the mileage of mains is small, due entirely to prevailing labor conditions in the city of Chicago during the year. There has been no increase in the outstanding capital stock or bonded indebtedness of the Company."

AT the annual meeting of the Fort Wayne (Ind.) Gas Company the Directors elected were: C. F. Dieterich, Walton Ferguson, A. B. Proal, George C. Clark, Anthony N. Brady, John Sloane, James H. Benedict, A. E. Dieterich, of New York; Henry C. Paul and C. S. Bash, of Fort Wayne; Hugh Dougherty, of Bluffton; James Murdock, of Lafayette.

THE Chicago *Tribune*, of recent date, said: "Judge J. Otis Humphrey of the Circuit Court of the Northern District of Illinois, to-day reversed the report of the master in chancery in regard to the suit of the Peoria Gas and Electric Company, and ordered that the suit be dismissed at the cost of the complainant on the ground that an unlawful combination in the arrangement had been entered into by and between the Peoria Gas Light and Coke Company and the Peoria Gas and Electric Company. The suit has been pending for upwards of 4 years and involves thousands of dollars. The city council passed an ordinance 4 years ago regulating the price of gas at 75 cents per 1,000 cubic feet. The Company immediately applied for an injunction, claiming that a municipality had not the power to regulate the price of gas. The city claimed that the two companies had illegally combined, and the decision of Judge Humphrey rests solely on this point. The case probably will be appealed to the Supreme Court of the United States, as its loss probably would bankrupt the two companies who have recently consolidated."

ACCORDING to the report filed by the officers of the San Francisco Gas and Electric Company, respecting its operations for the year 1903, it is declared that the revenues amounted to $2,505,212.25, made up of gas sales, $1,445,304.60; electric current sales, $997,407.01; other sources, $62,500.64. The cost of gas was $1,146,873.82, and of electric current, $783,381.83, a total of $1,930,255.65, leaving a net revenue of $574,956.60, from which dividends to the amount of $396,210.83 were paid, leaving at the end of the year a surplus of $178,745.77.

The Market for Gas Securities.

Minus figures prevail in the regular stock quotation list, save those marked against gas shares, notably in the instance of Consolidated, which is indexed by a plus mark. The closing in it to-day (Friday) was made at 191½ to 192. Earlier in the week it was much higher and early next month it will be higher still, unless fair signs fail; and we do not think that is likely. There is quite a demand for Mutual, and separate holders would do well not to accept anything under 350.

Brooklyn Union, is being bothered some by the gentlemen who live a part of the time in Albany; but as it appears that the main spring of the opposition proceeds from those in charge of the local electric lighting interests, no holder of the gas end of the game may care. Outside gas securities show no particular change.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 Wall Street, New York City.

February 22.

☞All communications will receive particular attention.

☞The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$78,177,000	100	191¼	192
Central Union, Bonds, 5's.	3,000,000	1,000	104	106
Equitable Bonds, 6's	1,000,000	1,000	105	..
" 1st Con. 5's	2,500,000	1,000	118	120
Metropolitan	658,000	..	108	112
Mutual	3,500,000	100	290	290
Municipal Bonds	750,000	..	..	..
New Amsterdam Gas Co. ..				
Bonds, 5's	11,000,000	1,000	103	105
Northern Union, Bonds, 5's.	1,250,000	1,000	105	106½
New York and East River ..				
Bonds 1st 5's	3,500,000	1,000	102	106
" 1st Con. 5's	1,500,000	..	109	111
Standard	5,000,000	100	125	135
Preferred	5,000,000	100	145	155
Bonds, 1st Mortgage, 5's	1,500,000	1,000	116	117
Yonkers	299,650	500	130	..
Out-of-Town Companies.				
Brooklyn Union	15,000,000	100	185	195
" " Bonds (5's)	15,000,000	1,000	113	115
Bay State	50,000,000	50	3/16	¼
" Income Bonds	2,000,000	1,000	..	75
Binghamton Gas Works	450,000	100	28	30
" 1st Mtg. 5's	500,000	1,000	93	96
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	4⅜	4¼
" " Bonds, 5's	5,250,000	1,000	65	69
Capital, Sacramento	500,000	50	..	85
Bonds (6's)	150,000	1,000	..	..
Chicago Gas Co. Guaranteed Gold Bonds	7,650,000	1,000	104	104¼
Cincinnati Gas and Electric Co.	29,500,000	100	97¾	98
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	101	101½
Columbus (O.) Gas Lt. & Heating Co	1,682,750	100	88¾	89¼
Preferred	3,096,500	100	107¾	109
Consumers, Jersey City Bonds	600,000	1,000	100	102

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MRS. ALICE CARY WATERMAN

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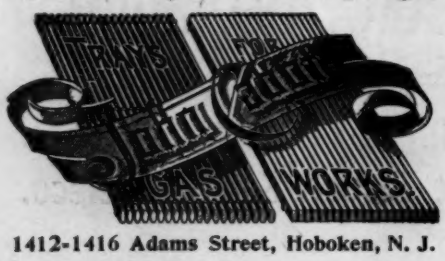

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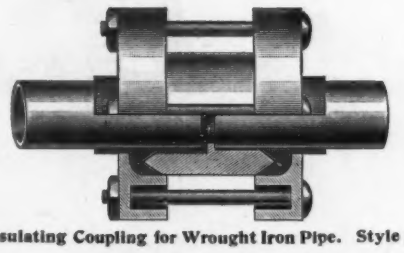

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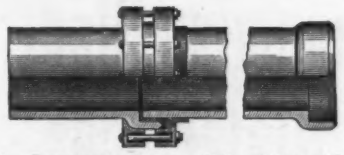

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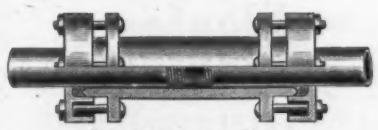

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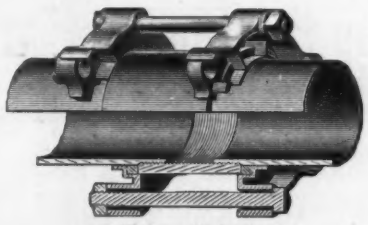

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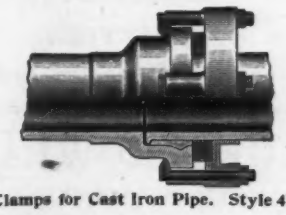

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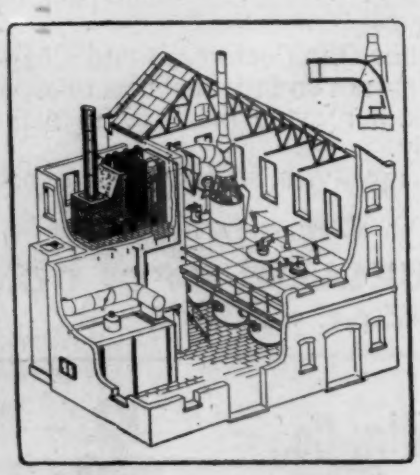

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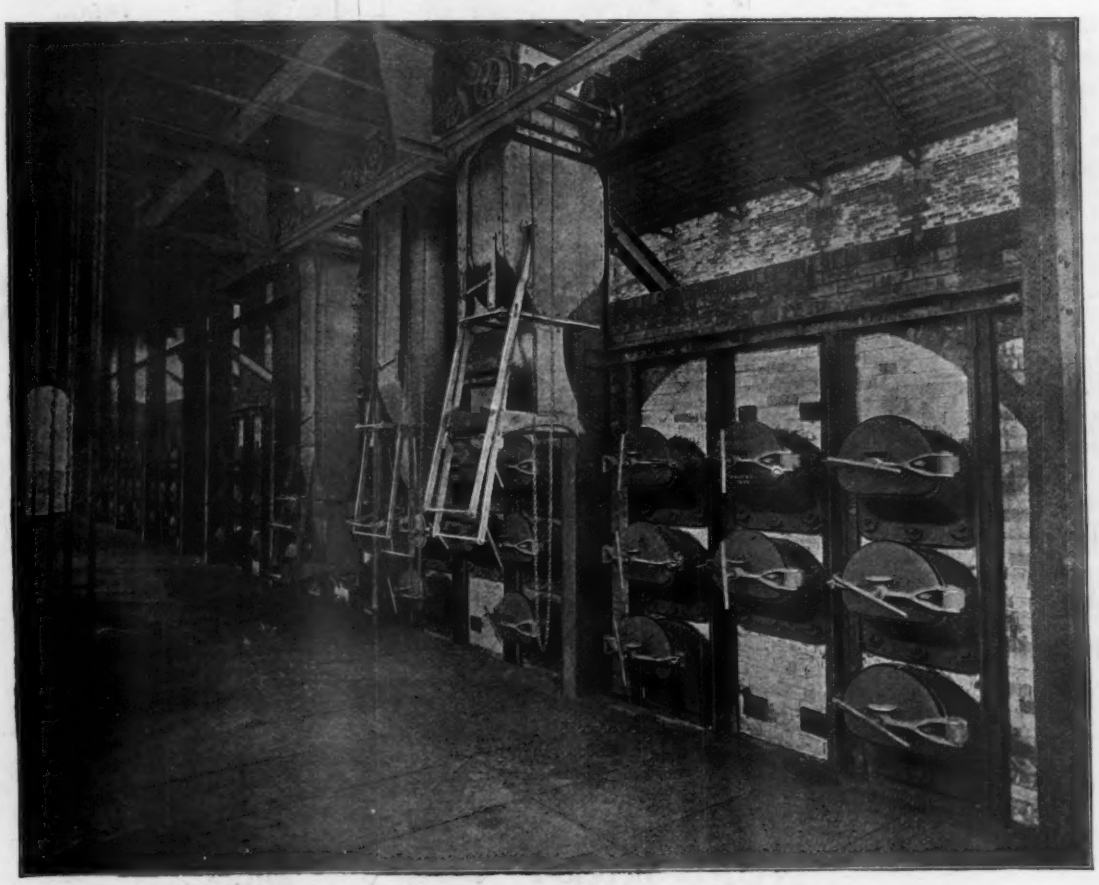

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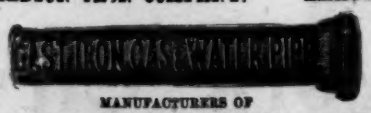

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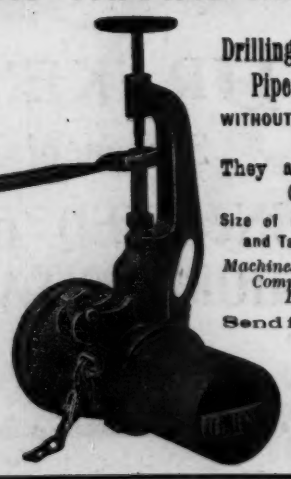

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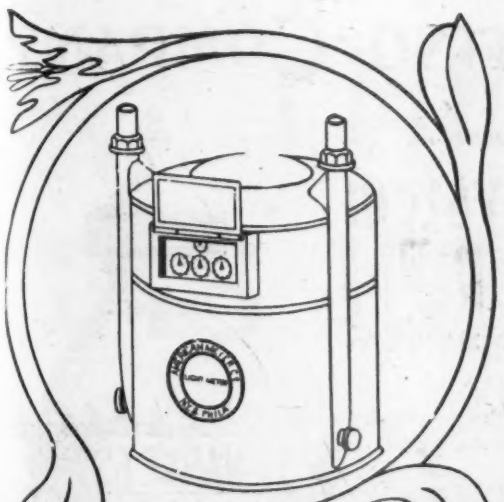
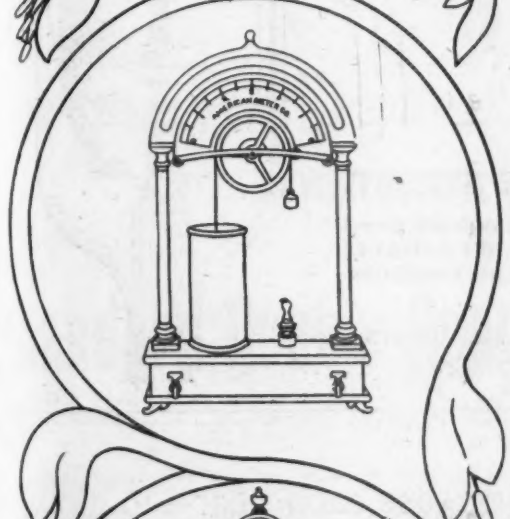
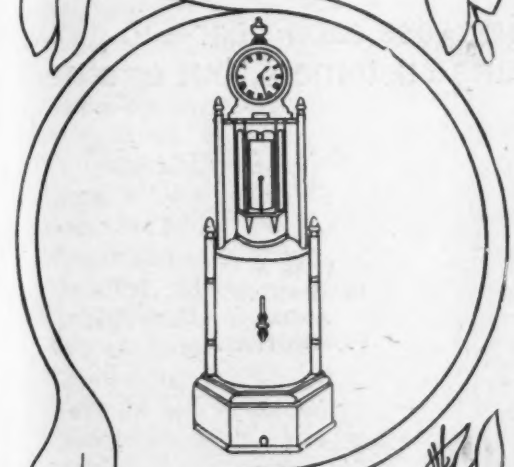
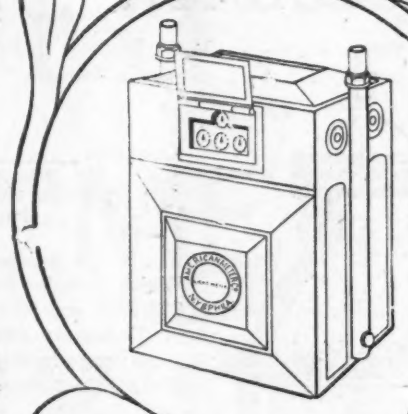
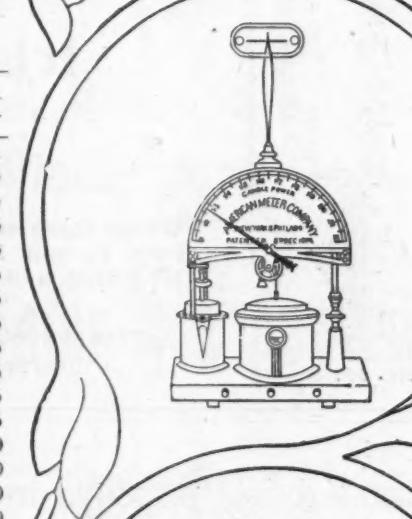
ST. LOUIS,
SAN FRANCISCO.

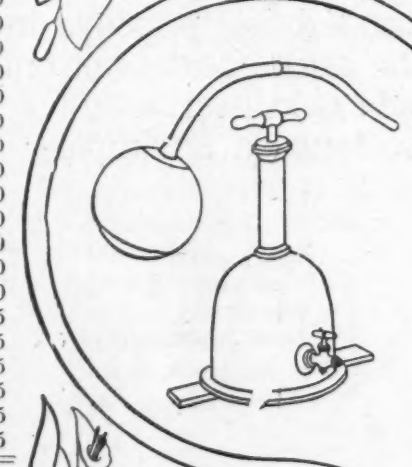


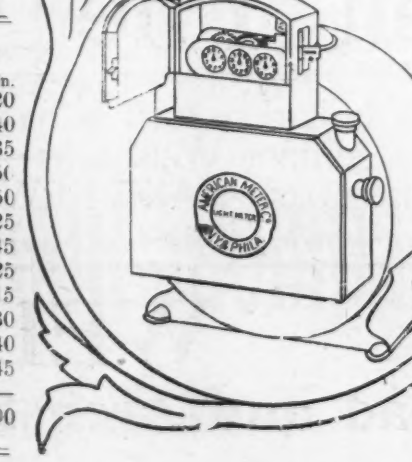












PUBLIC LIGHTING TABLE.

MARCH, 1904.

Day of Week.	Date.	Table No. 1. FOLLOWING THE MOON. Light.	Extinguish.	Table No. 2. NEW YORK CITY. ALL NIGHT LIGHTING. Light.	Extinguish.
				P.M.	A.M.
Tue.	1	No L. FM	No L.	5.30	5.45
Wed.	2	No L.	No L.	5.30	5.45
Thu.	3	6.20 PM	9.00 PM	5.30	5.45
Fri.	4	6.20	10.10	5.30	5.45
Sat.	5	6.20	11.20	5.40	5.35
Sun.	6	6.30	12.20 AM	5.40	5.35
Mon.	7	6.30	1.20	5.40	5.35
Tue.	8	6.30 LQ	2.20	5.40	5.35
Wed.	9	6.30	3.10	5.40	5.35
Thu.	10	6.30	3.50	5.40	5.35
Fri.	11	6.30	4.30	5.40	5.35
Sat.	12	6.30	5.10	5.50	5.20
Sun.	13	6.40	5.10	5.50	5.20
Mon.	14	6.40	5.10	5.50	5.20
Tue.	15	6.40	5.10	5.50	5.20
Wed.	16	6.40 NM	5.10	5.50	5.20
Thu.	17	6.40	5.10	5.50	5.20
Fri	18	6.40	5.10	5.50	5.20
Sat.	19	6.40	5.10	6.00	5.10
Sun	20	6.40	5.00	6.00	5.10
Mon.	21	9.40	5.00	6.00	5.10
Tue.	22	10.40	5.00	6.00	5.10
Wed.	23	11.40	5.00	6.00	5.10
Thu.	24	12.30 AM FQ	5.00	6.00	5.10
Fri.	25	1.20	5.00	6.00	5.10
Sat.	26	2.10	5.00	6.10	4.55
Sun.	27	2.50	4.50	6.10	4.55
Mon.	28	3.40	4.50	6.10	4.55
Tue.	29	No L.	No L.	6.10	4.55
Wed.	30	No L. FM	No L.	6.10	4.55
Thu.	31	No L.	No L.	6.10	4.55

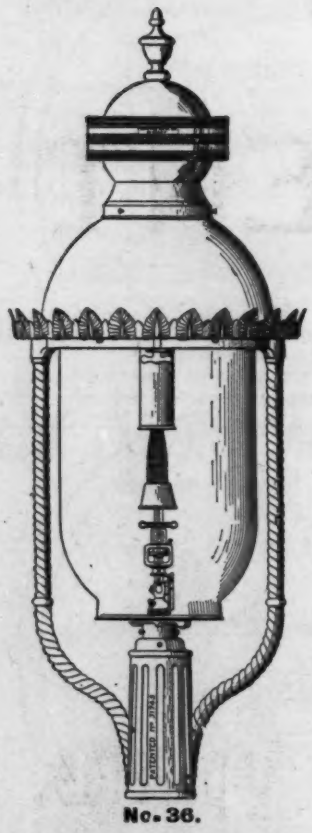
TOTAL HOURS LIGHTING DURING 1904.

By Table No. 1.	Hrs. Min.	By Table No. 2.	Hrs. Min.
January	225.00	January	423.20
February	205.40	February	367.40
March	187.40	March	355.35
April	169.50	April	298.50
May	152.30	May	264.50
June	137.20	June	234.25
July	138.50	July	243.45
August	151.00	August	280.25
September	164.40	September	321.15
October	191.30	October	374.30
November	210.30	November	401.40
December	237.10	December	433.45
Total, yr.	2171.40	Total, yr.	4000.00

NEW YORK, 33 Nassau Street. BOSTON, 814 Beacon Building. PHILADELPHIA, Broad and Arch Streets. ST. LOUIS, 712 Roe Building. CHICAGO, Foot of Orleans Street. SAN FRANCISCO, 712 Polk Street.

WELSBACH STREET LIGHTING COMPANY

.... OF AMERICA ....



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Which includes its specially DESIGNED AND PATENTED BURNER for STREET and PARK LIGHTING exclusively.

Uniformly SUCCESSFUL in 150 Cities and Towns.

By means of the Welsbach System of street lighting the superiority of GAS over electricity for street lighting has been fully demonstrated.

POINTS OF MERIT:

It is { Economical, Attractive, Successful, Up-to-date.

IT LIGHTS THE STREET.

Where there are no gas mains we can furnish an equally good light by our SELF-GENERATING NAPHTHA WELSBACH BURNER, and thereby supply a uniform light in all localities.

Correspondence Solicited from Gas Companies and Others interested in Municipal and Outside Lighting.

No. 38.

AN underlying principle in business is to show an increase each year---to grow. The astute dealer not only seeks to retain this year's customers, but to attract new trade next year.

The formula is simple-

THIS SHIELD IS THE WELSBACH TRADE MARK.

IT IS A GUARANTEE AND A PROTECTION.

Sell The Welsbach Brands.

The imitation stuff is bad for the customer---which is bad for you.

The genuine Welsbachs---Burners or Mantles---make satisfied customers---keep customers---MAKE NEW ONES.

And your profit isn't merely dollars and cents.

WELSBACH CO.,

Broad and Arch Sts., PHILADELPHIA.

THE UNITED GAS IMPROVEMENT COMPANY

For the Year Ending December 31, 1903, has been Awarded Contracts in the Following Places for

Standard Double-Superheater Lowe Water Gas Apparatus.

Rochester, N. Y.	Chester, Pa.	Savannah, Ga.
Baltimore, Md.	Lynn, Mass.	New York (Central Union Co.)
Chicago, Ills.	Newark, N. J.	Cicero, Ills.
Amesbury, Mass.	Washington, D. C.	Chicago (Ogden Co.)
Aberdeen, S. D.	Boone, Ia.	Easton, Pa.
Winsted, Conn.	Pueblo, Col.	Lawrence, Mass.
Canon City, Col.	Charlotte, N. C.	Council Bluffs, Ia.
Schenectady, N. Y.	Fall River, Mass.	Chattanooga, Tenn.
Hagerstown, Md.	Duluth, Minn.	Tuckerton, N. J.
Malden, Mass.	New York (Mutual Co.)	Springfield, O.
Bridgeport, Conn.	Waltham, Mass.	Easton, Pa. (2d contract).
Albert Lea, Minn.	Dover, Del.	Mobile, Ala.
Brooklyn, N. Y.	York, Pa.	Conshohocken, Pa.
Kansas City, Kas.	Minneapolis, Minn.	Mason City, Ia.
Hempstead, N. Y.	Allentown, Pa.	

TOTAL SETS FOR 1903, ... 62
TOTAL DAILY CAPACITY, ... 62,950,000 cubic feet.
TOTAL SETS TO DATE, ... 508
TOTAL DAILY CAPACITY, ... 362,780,000 cubic feet.

The United Gas Improvement Company,

Broad and Arch Streets, Philadelphia.

Established 1858. Incorporated 1890.
CHAS. E. GREGORY, Prest. DAVID R. DALY, V.-Prest. & Treas.
H. D. ABERNETHY, Sec.

J. H. Gautier & Co.

Greene & Essex Streets,
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FIRE BRICK . . .
RETORT SETTINGS

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Also Miners and Shippers of Fireclay, Fire Sand, Ground Brick in Barrels.

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OFFICE: 119 E. 23D STREET, NEW YORK CITY

CONSOLIDATED GAS CO. OF NEW JERSEY, LONG BRANCH, N J., September 28th, 1903.

ADAM WEBER SONS,
Park Row Building, New York City:

GENTLEMEN—In answer to your inquiry of even date, in regard to the condition of our 5 benches of 6's, I would say that, during the 33 months in which these benches have been in use, we have produced 248,000,000 cubic feet of gas from them. During this period 24 retorts were in use for 18 months, and 30 retorts for 15 months. The average number of retorts in use during the entire period was 26.7. The average make per retort for the 33 months was 9,325,000 cubic feet. We expect to run these benches for 3 months more, and we estimate that our make of coal gas for the 36 months will amount to 269,600,000 cubic feet, or 10,060,000 cubic feet per retort.

As far as we can see at the present time, it will only be necessary for us to put in new retorts in resetting these benches, as the furnace blocks and recuperative flues are in very good condition.

Yours very truly,
(Signed) W. B. TUTTLE,
General Manager.

ISAAC C. BAXTER, President. ESTABLISHED 1864. PETER YOUNG, Sec'y and Treas.

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HENRY MAURER & SON,

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EXCELSIOR FIRE BRICK & CLAY

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BENCH SETTINGS,
Fire Brick, Tiles, Etc.

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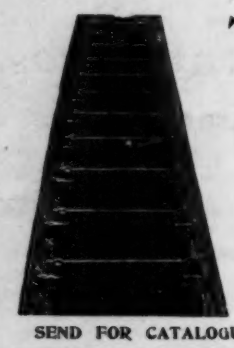

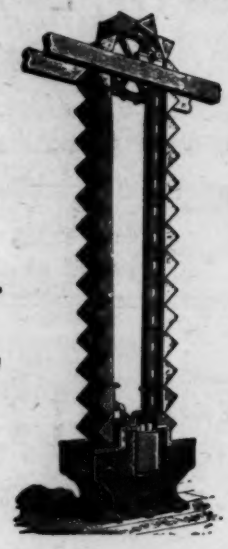

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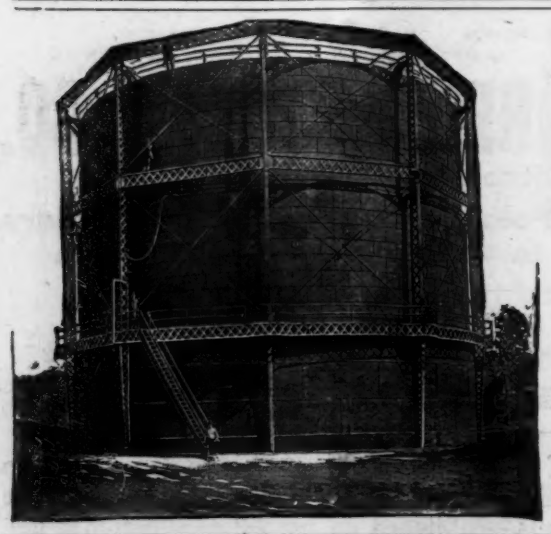

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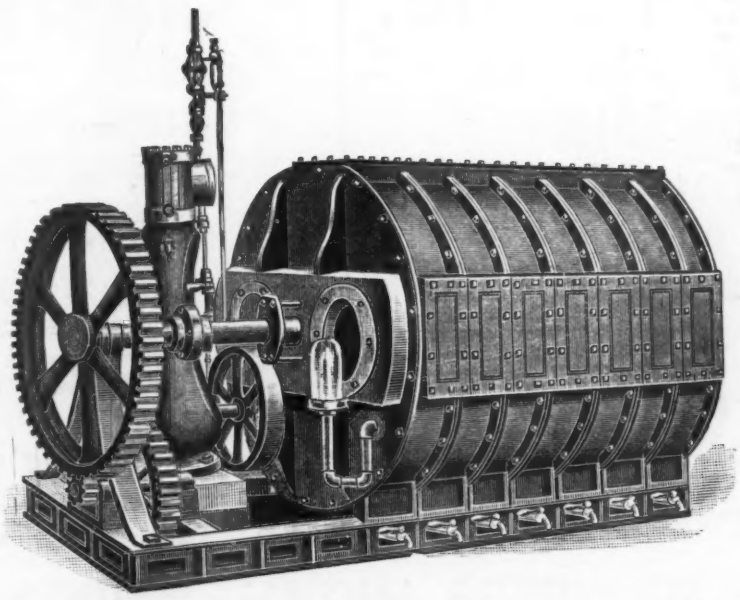

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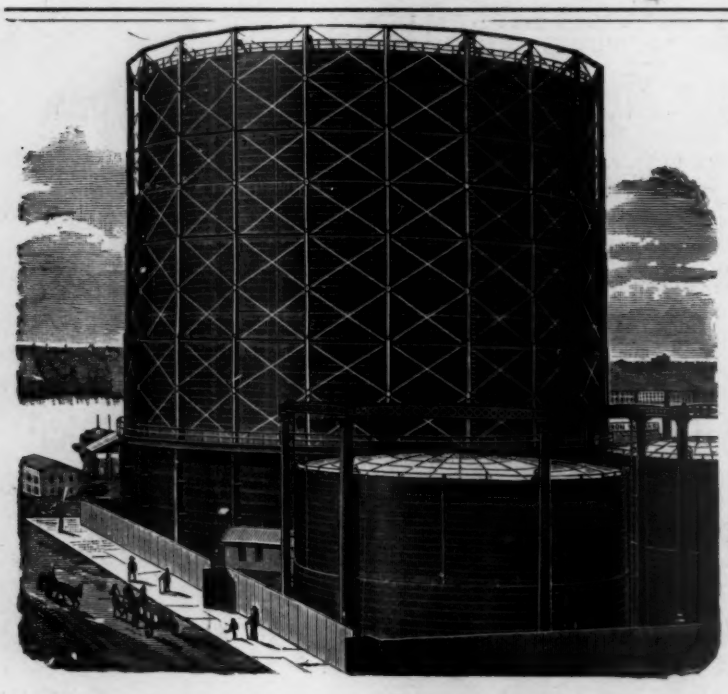

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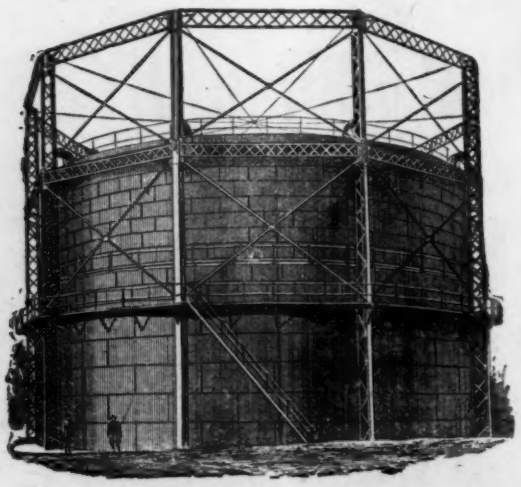

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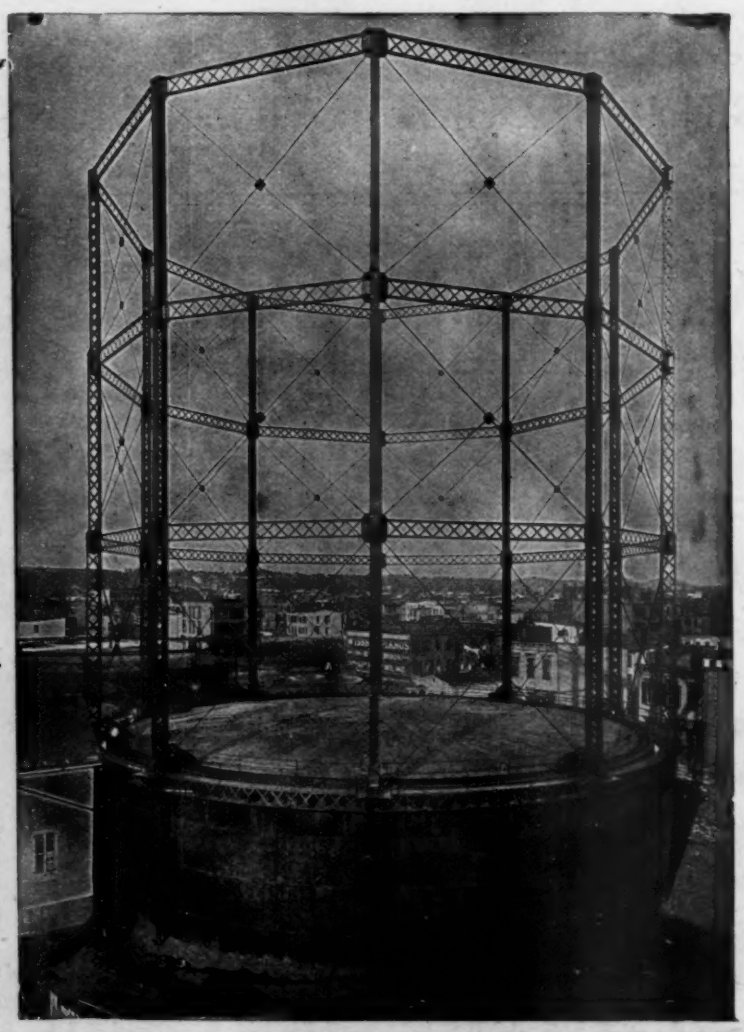

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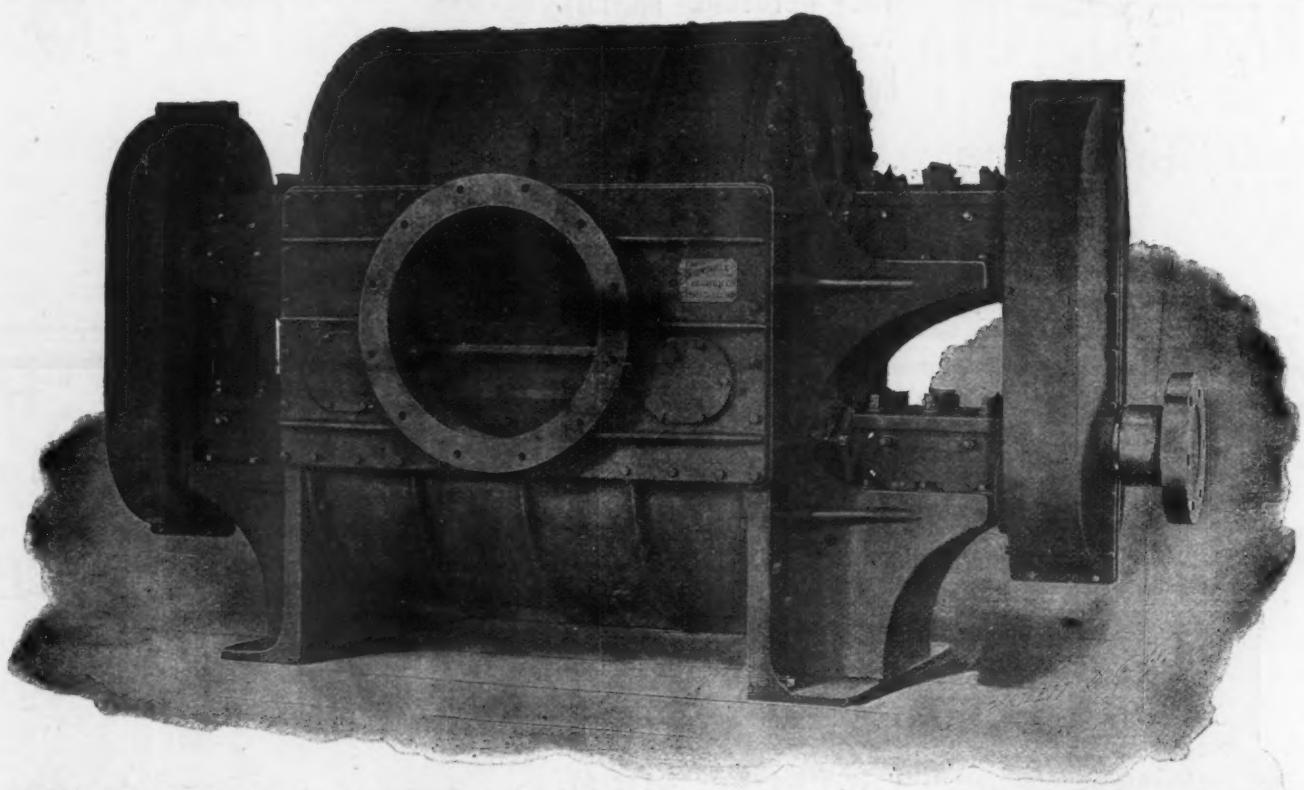

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